

For Review and Approval

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July 28, 1994

Mr. Thomas A. Baillieul
 Acting Project Manager, BCLDP
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 505 King Avenue
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Dear Mr. Baillieul:

Characterization Report for Storm Sewer Outfalls at West Jefferson Site

Enclosed is the final Characterization Report for the Storm Sewer Outfalls at the West Jefferson North Site, dated July 1994.

If you have any questions regarding the report, please contact Joe Poliziani of my staff at 424-7776.

Sincerely,

original signed
VE Castleberry

V. Edward Castleberry
 BCLDP Operations Manager

VEC:rho



**CHARACTERIZATION REPORT
FOR STORM SEWER OUTFALLS
AT WEST JEFFERSON SITE**

July 1994

**BATTTELLE
505 King Avenue
Columbus, Ohio 43201**

**CHARACTERIZATION REPORT
FOR STORM SEWER OUTFALLS
AT WEST JEFFERSON SITE**

July 1994

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CHARACTERIZATION REPORT FOR STORM SEWER OUTFALLS AT WEST JEFFERSON SITE

Introduction

The characterization of the storm sewer outfalls at the Battelle Columbus Operations, West Jefferson North Site was completed in September 1993 under Work Instruction 20. The characterization effort included eight of nine outfall locations. These locations are shown in Figure 1. Work was performed using guidelines provided in Battelle Columbus Decommissioning and Decontamination Project (BCLDP) Report DD-93-14, "Storm Sewer Outfall Characterization Plan For the West Jefferson Site" (Attachment A). Any deviations from the Characterization Plan are discussed for each outfall location. All sampling and related activities were conducted in accordance with BCLDP procedures SC-SP-004.2, "Manual Collection of Surface and Subsurface Soil Samples In Support of Site Characterization", SC-SP-006, "Sampling of Sediment and Sludge For Chemical and Radiological Characterization", and HP-OP-011, "Release of Materials from Controlled Areas".

Samples were collected using a 12-inch long, 2-inch diameter split-barrel core sampler and a 24-inch long, 2-inch diameter continuous core sampler (with the exception of SS-JN1-2). The Characterization Plan required samples to be collected at varying depths and subsequently divided into equal segments for analysis. Samples were collected separately at those discrete depths to ensure more accurate depth-related analytical results. Samples were collected in the following manner:

- 12-inch samples - one sample at a depth of 0 to 6 inches and one sample at a depth of 6 to 12 inches
- 24-inch samples - one sample at a depth of 0 to 12 inches and one sample at a depth of 12 to 24 inches
- 36-inch samples - one sample at a depth of 0 to 12 inches, one sample at a depth of 12 to 24 inches, and one sample at a depth of 24 to 36 inches

Each depth was sent as a separate sample to the laboratory for analysis. Consequently, the term "sample" used in this report refers to a discrete depth at the specific sampling location. To ensure an adequate volume of soil/sediment was obtained, two adjacent cores were taken for each sample location.

Liquid effluent samples were collected in November 1993 at outfalls SS-JN3-1, SS-SD-1, SS-JN1-1, SS-JN1-2, and SS-JN1-3 after a major storm.

Soil samples were sent to the Battelle Radioanalytical Laboratory (RAL) for gross alpha/gross beta analysis and gamma spectroscopy analysis. Sample analytical results from each outfall were evaluated separately. For each outfall, the samples exhibiting the highest gross alpha/gross beta and gamma spectroscopy results were selected and sent to International Technology Analytical Services (ITAS) in Richland, Washington for alpha spectroscopy. Liquid effluent samples were sent to ITAS in St. Louis, Missouri for gamma scan, isotopic plutonium, isotopic thorium, isotopic uranium, radium, and strontium analysis. Sample locations, depths, and corresponding RAL identification numbers are listed in Table 1.

In general, analytical results showed levels of most radionuclides to be within the range of background and well below the release guidelines found in the BCLDP Decontamination and Decommissioning Plan. One notable exception is outfall SS-JN1-2, for which analytical results indicated levels of cobalt-60 and cesium-137 above release criteria in the soil. Analytical results for liquid effluent from outfall SS-JN1-2 indicated levels of cobalt-60 and cesium-137 greater than minimum detectable activity (MDA), but less than the limits set forth in the Decommissioning Plan.

Training

All technicians were formally trained and qualified on the procedures used prior to the initiation of the storm sewer outfall sampling effort. The project was overseen by a Certified Health Physicist and several National Registry of Radiological Protection Technologists (NRRPT) certified technicians provided quality assurance and oversight during the performance of work in the field.

Instrumentation

Direct reading gas proportional survey instruments sensitive to alpha and beta radiation were used to monitor samples, sample containers, and sampling equipment for residual radioactive materials. A Ludlum Model 43-20 gas proportional detector (180 cm^2 detection area) with Eberline ESP-2 instruments was used to scan sample media and sampling equipment. Thin, flat-plate technetium-99 and thorium-230 standards traceable to the National Institute of Standards and Testing (NIST) were used to calibrate the gas proportional instruments for alpha and beta detection, respectively.

Smear samples were counted using a Tennelec Model LB5100 Simultaneous Alpha and Beta Gas Proportional Counter.

Exposure rate measurements were performed using a Ludlum Model 19 Exposure Rate Meter.

Gamma spectroscopy was performed using a Nuclear Data 661680 data acquisition system in conjunction with a germanium-lithium detector.

Alpha spectroscopy was performed using a surface barrier type detector.

Background Determination

Mean natural background radioactivity levels for soil samples were determined from analytical results of soil sampled during the characterization effort by the application of Chauvenet's Criterion^a. Chauvenet's Criterion is a statistical test that identifies values (i.e., radioactivity levels) that lie outside the normal (Gaussian) background distribution. Mean background activity concentrations are listed in Table 2. Data points that were identified to be outside the expected

^a Beers, Y., 1953. Introduction to the Theory of Error, pp 23-25. Addison-Wesley, Cambridge, MA.

background distribution were excluded from the calculation of the mean background activity concentrations.

Sampling Results

SS-JN3-1

Outfall SS-JN3-1 is located at the northwest end of the small cove of Battelle Lake, due west of building JN-2. SS-JN3-1 drains the foundation and roof of building JN-3. Two sediment samples were collected. Sediment sample #1 was collected 10 to 12 feet from the outfall in the shallow end of the cove (corresponding to sample point #1 in the Characterization Plan). Sediment sample #2 was collected approximately 50 feet from the outfall (corresponding to sample point #2 in the Characterization Plan). Sample #3 was not able to be collected due to depth of water at the sampling location. Sample #1 was sent for alpha spectroscopy. Sample analytical results for outfall SS-JN3-1 are listed in Table 3. One liquid effluent sample was collected. Effluent sample results are listed in Table 4.

SS-JN3-2

Outfall SS-JN3-2 is also located at the northwest end of the small cove of Battelle Lake, due west of building JN-2, near outfall SS-JN3-1. It drains the foundation and roof of building JN-3. A soil sample for SS-SD-1 at location A6 (sec Figure 3) also corresponded to location D4 (Figure 2) of SS-JN3-2, therefore the sample from SS-SD-1 was used the satisfy the requirement for SS-JN3-2 and is reported in Table 5. Sediment samples collected for the characterization of SS-JN3-1 were used to satisfy the sampling points required for SS-JN3-2 as well. Sediment sample results are reported in Table 3.

SS-SD-1

Outfall SS-SD-1 is located at the northwest end of the small cove of Battelle Lake, west of JN-2 and east of outfall SS-JN3-1. SS-SD-1 is a surface drain that drains the areas between buildings JN-2 and JN-3. A generic steep-slope sampling grid (Figure 3) was used for this location. One soil core 24 inches deep was collected at the mouth of the outfall (location B1, Figure 3). Three 12-inch soil cores were collected along the fall line (line B). Five 12-inch soil cores were collected along the

plume lines (lines A and C). Eight samples were sent for alpha spectroscopy. Analytical results for soil samples are listed in Table 5. The sediment core collected at sample point #1 in the characterization of SS-JN3-1 was also used to satisfy the requirement for SS-SD-1. One liquid effluent sample was collected. Results for the liquid effluent sample are listed in Table 4.

SS-JN2-1

Outfall SS-JN2-1 is located in a flat field approximately 70 feet south of the old guardhouse between buildings JN-2 and JN-3. SS-JN2-1 drains the foundation and roof of building JN-2. The outfall was buried, so location was approximated. The generic flat-ground sampling grid (Figure 2) was used for this location. Eight 36-inch soil cores were collected at locations specified in the Characterization Plan. Six samples were sent for alpha spectroscopy. Sample results are listed in Table 6. The liquid effluent sample was not able to be collected because the outfall line was buried.

SS-SD-2

Outfall SS-SD-2 was removed in 1987 and its discharge was rerouted to SS-JN1-1. SS-SD-2 was a surface drain located on the bank of Battelle Lake, south of building JN-1. One 12-inch soil core was collected at the mouth of the outfall. Both depths were sent for alpha spectroscopy. Analytical results from this outfall are reported in Table 7. An exposure rate survey was performed from the mouth of the outfall to the water's edge. No readings above background levels ($8 \mu\text{R}/\text{hr}$) were observed.

SS-JN1-1

Outfall SS-JN1-1 is located on the bank of Battelle Lake, south-southeast of building JN-1. It drains the roof and foundation of building JN-1. Ambient background levels were elevated due to shine from JN-1. The generic steep-slope sampling grid (Figure 3) was used at this location. Two 24-inch and two 12-inch soil cores were collected along the fall line. Six 12-inch cores were collected along the suspected plume lines. Five samples were sent for alpha spectroscopy. Sample results are listed in Table 8. One liquid effluent was collected. Analytical results for liquid effluent sample are in Table 4.

SS-JN1-2

Outfall SS-JN1-2 is located on the bank of Battelle Lake, south-southeast of building JN-1 and east of SS-JN1-1. SS-JN1-2 drains the roof and foundation of JN-1. Ambient background exposure rate levels were elevated due to gamma radiation emitted from the radioactive material present in JN-1. The generic steep-slope sampling grid was used at this location. The sampling area was covered with large rocks (10 to 20 inches in diameter) extending to a depth of approximately 3 feet into the underlying soil. Therefore, circumstances necessitated deviation from the Characterization Plan. A surface soil sample (0 to 6 inches) was collected at location B1 using a stainless steel scoop. Elevated alpha-plus-beta readings were observed on the exposed soil (approximately 4300 net dpm). Another surface soil sample was collected by filtering soil through a sieve. The sample area was approximately 10 square meters and encompassed locations B3 and B5. A 24-inch sediment core was collected at location B7, approximately 3 feet from the shore. All soil/sediment samples were sent for alpha spectroscopy. Gamma spectroscopy results for soil showed levels of cobalt-60 and cesium-137 above MDA and release criteria. Analytical results are listed in Table 9. One liquid effluent sample was collected. Liquid effluent sample results are reported in Table 4.

SS-JN1-3

Outfall SS-JN1-3 is located east of building JN-1 and the well house, outside the outer security fence. SS-JN1-3 drains the roof and foundation of JN-1. The generic flat-ground sampling grid was used at this location. Thirty-six-inch soil cores were collected at the eight locations specified for this grid pattern. Eight samples were sent for alpha spectroscopy. Sample analytical results are reported in Table 10. One liquid effluent sample was collected. Gamma spectroscopy results showed potassium-40 present at above-MDA levels. Liquid effluent sample results are reported in Table 4.

Conclusions

Analytical results of soil and liquid samples collected around storm sewer outfalls SS-JN3-1, SS-JN3-2, SS-SD-1, SS-JN2-1, SS-SD-2, SS-JN1-1, and SS-JN1-3 show activity levels and concentration to be below release limits for all radionuclides of concern as described in DD-93-03,

"Volumetric Release Criteria Technical Basis Document". Analytical results for the soil samples collected at outfall SS-JN1-2 indicate levels of cobalt-60 (approximately 1 to 3 pCi/g) and cesium-137 (approximately 120 to 340 pCi/g) above release limits. However, the contamination appears to be limited to the area directly under the mouth of the outfall and does not extend down the bank and into the lake.

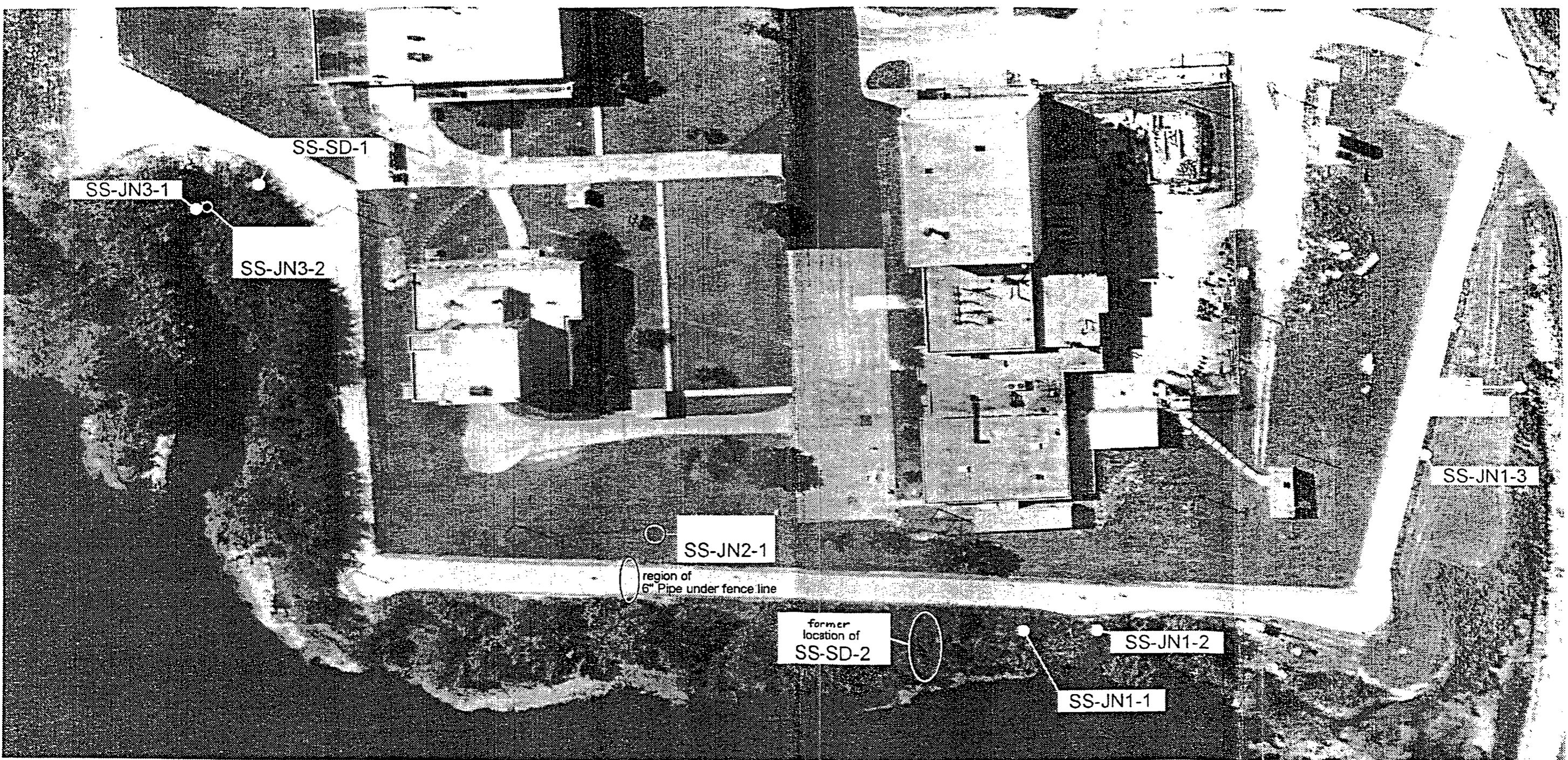


Figure 1. Storm Sewer Outfall Locations
Aerial Photograph of West
Jefferson Storm Sewer Outfalls

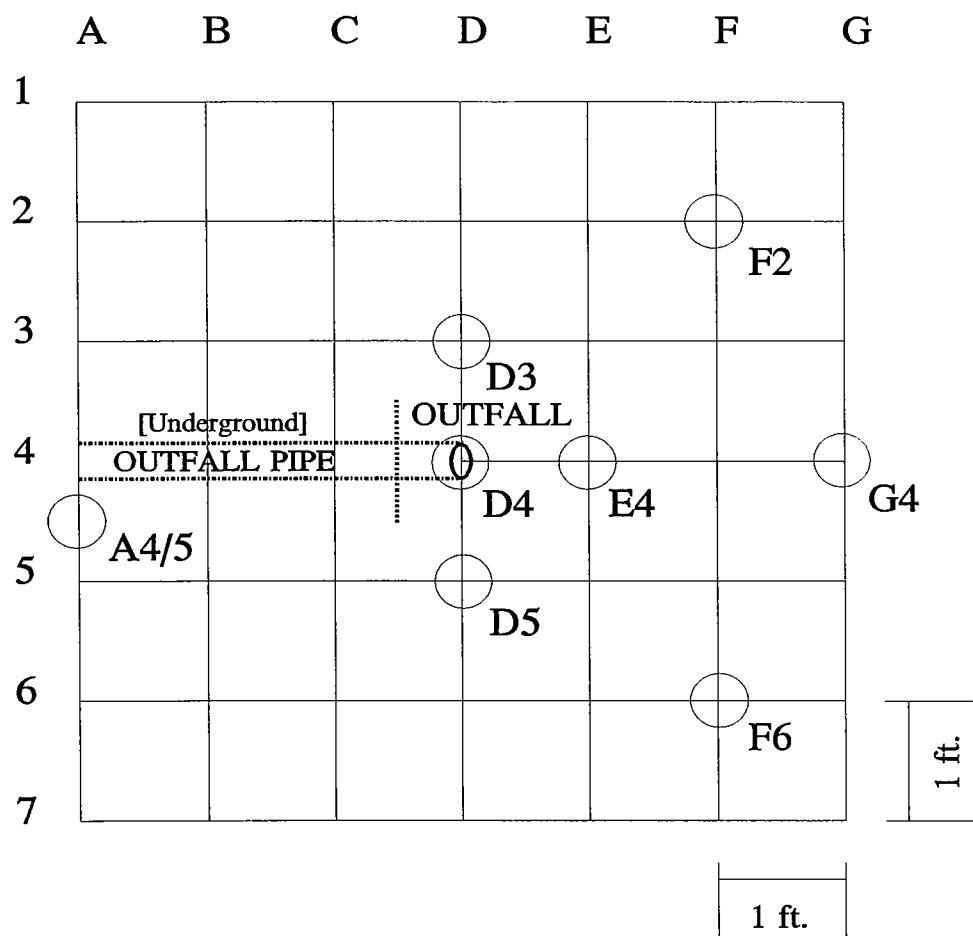


Figure 2. Generic Flat-Ground Sampling Grid

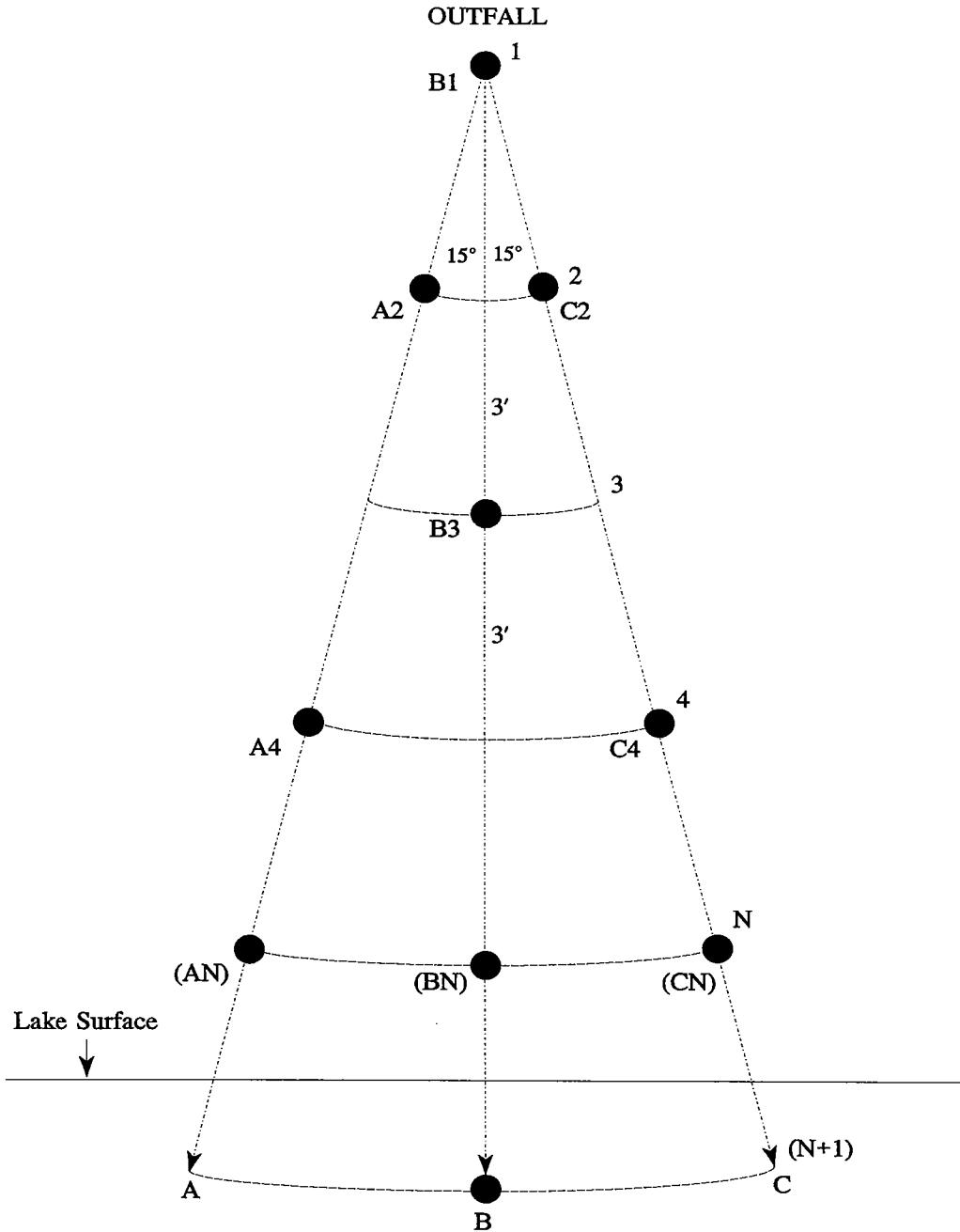


Figure 3. Generic Steep-Slope Sampling Grid

TABLE 1.
IDENTIFICATION OF SAMPLES

Outfall Location	Grid Point	Sample Medium	Depth (in)	RAL EL #	Sent for alpha spectroscopy
SS-JN3-1	North	Sediment	0-24	6459	X
	South	Sediment	0-24	6460	
	B1	Effluent	N/A ^a	6777D	X
SS-SD-1	B1	Soil	0-12	6380	
	B1	Soil	12-24	6381	
	B3	Soil	0-6	6382	
	B3	Soil	6-12	6383	
	B5	Soil	0-6	6384	
	B5	Soil	6-12	6385	
	B7	Soil	0-6	6386	X
	B7	Soil	6-12	6387	X
	A2	Soil	0-6	6388	
	A2	Soil	6-12	6389	
	A4	Soil	0-6	6390	X
	A4	Soil	6-12	6391	X
	A6	Soil	0-6	6392	X
	A6	Soil	6-12	6393	X
	C2	Soil	0-6	6394	
	C2	Soil	6-12	6395	
	C4	Soil	0-6	6396	
	C4	Soil	6-12	6397	
	C6	Soil	0-6	6398	X
	C6	Soil	6-12	6399	X
	C8	Soil	0-6	6400	
	C8	Soil	6-12	6401	
	B1	Effluent	N/A	6777E	X

TABLE 1.
(Continued)

Outfall Location	Grid Point	Sample Medium	Depth (in)	RAL EL #	Sent for alpha spectroscopy
SS-JN2-1	D4	Soil	0-12	6267	
	D4	Soil	12-24	6268	
	D4	Soil	24-36	6269	
	D3	Soil	0-12	6270	X
	D3	Soil	12-24	6271	X
	D3	Soil	24-36	6272	X
	D5	Soil	0-12	6273	
	D5	Soil	12-24	6274	
	D5	Soil	24-36	6275	X
	E4	Soil	0-12	6276	
	E4	Soil	12-24	6277	
	E4	Soil	24-36	6278	
	F2	Soil	0-12	6279	
	F2	Soil	12-24	6280	
	F2	Soil	24-36	6281	X
	F6	Soil	0-12	6282	
	F6	Soil	12-24	6283	
	F6	Soil	24-36	6284	
	G4	Soil	0-12	6285	
	G4	Soil	12-24	6286	X
	G4	Soil	24-36	6287	
	A4/5	Soil	0-12	6288	
	A4/5	Soil	12-24	6289	
	A4/5	Soil	24-36	6290	
SS-SD-2	Mouth	Soil	0-6	6416	X
	Mouth	Soil	6-12	6417	X

TABLE 1.
(Continued)

Outfall Location	Grid Point	Sample Medium	Depth (in)	RAL EL #	Sent for alpha spectroscopy
SS-JN1-1	B1	Soil	0-12	6437	
	B1	Soil	12-24	6438	
	B3	Soil	0-6	6439	
	B3	Soil	6-12	6440	
	B5	Soil	0-6	6441	X
	B5	Soil	6-12	6442	X
	C2	Soil	0-6	6443	
	C2	Soil	6-12	6444	
	C4	Soil	0-6	6445	
	C4	Soil	6-12	6446	
	C6	Soil	0-6	6447	X
	C6	Soil	6-12	6448	X
	A2	Soil	0-6	6449	
	A2	Soil	6-12	6450	
	A4	Soil	0-6	6451	
	A4	Soil	6-12	6452	
	A6	Soil	0-6	6453	
	A6	Soil	6-12	6454	
	B7	Soil	0-24	6455	X
	B1	Effluent	N/A	6777A	X
SS-JN1-2	B7	Sediment	0-24	6456	X
	B1	Soil	0-6 ^b	6457	X
	B3/5	Soil	NK ^c	6458	X
	B1	Effluent	N/A	6777B	X
SS-JN1-3	D4	Soil	0-12	6310	X
	D4	Soil	12-24	6311	X
	D4	Soil	24-36	6312	X

TABLE 1.
(Continued)

Outfall Location	Grid Point	Sample Medium	Depth (in)	RAL EL #	Sent for alpha spectroscopy
SS-JN1-3 (Continued)	D3	Soil	0-12	6313	X
	D3	Soil	12-24	6314	
	D3	Soil	24-36	6315	
	D5	Soil	0-12	6316	X
	D5	Soil	12-24	6317	X
	D5	Soil	24-36	6318	X
	E4	Soil	0-12	6319	
	E4	Soil	12-24	6320	
	E4	Soil	24-36	6321	
	F2	Soil	0-12	6322	X
	F2	Soil	12-24	6323	
	F2	Soil	24-36	6324	
	F6	Soil	0-12	6325	
	F6	Soil	12-24	6326	
	F6	Soil	24-36	6327	
	G4	Soil	0-12	6328	
	G4	Soil	12-24	6329	
	G4	Soil	24-36	6330	
	A4/5	Soil	0-12	6331	
	A4/5	Soil	12-24	6332	
	A4/5	Soil	24-36	6333	
	B1	Effluent	N/A	6777C	X

^a N/A = not applicable

^b Sample depth approximate due to sampling conditions.

^c NK = not known; sample was collected from all available soil in a 10 square meter area.

TABLE 2.
BACKGROUND ACTIVITY CONCENTRATIONS FOR STORM SEWER OUTFALL
SOIL SAMPLING

Radionuclide	Mean Activity Concentration ^a $\pm 2\sigma$ (pCi/g)
K-40	1.465E+01 \pm 7.686E+00
Co-60	4.327E-02 \pm 2.966E-02
Cs-134	8.964E-02 \pm 7.294E-02
Cs-137	1.760E-01 \pm 2.574E-01
Tl-208	2.485E-01 \pm 2.710E-01
Bi-212	1.035E+00 \pm 1.385E+00
Pb-212	8.606E-01 \pm 8.388E-01
Bi-214	6.642E+00 \pm 8.762E+00
Pb-214	4.194E+00 \pm 7.086E+00
Ra-224	2.068E+00 \pm 1.484E+00
Ra-226	2.928E+00 \pm 2.508E+00
Ac-228	8.107E-01 \pm 7.960E-01
Th-234	2.413E+00 \pm 1.184E+00
Pa-234m	8.429E+00 \pm 3.856E+00

^a Background values were calculated from analytical data using Chauvenet's Criterion for Rejection of Data. Values in this table are the mean values calculated from all data falling within the parameters of the Chauvenet's test.

TABLE 3.
ANALYTICAL RESULTS FOR SOIL SAMPLES FROM SS-JN3-1

Analytical Parameter	EL# 6459		EL# 6460	
	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)
Gross α	1.67E+01	1.19E+01	1.22E+01	1.01E+01
Gross β	2.38E+01	4.38E+00	3.14E+01	5.02E+00
RAL Gamma Spectroscopy Results				
Be-7	<MDA ^a	<MDA	<MDA	<MDA
K-40	1.42E+01	1.72E+00	<MDA	<MDA
Co-60	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA
Cs-137	2.73E-01	5.92E-02	9.22E-02	6.15E-02
Eu-152	<MDA	<MDA	<MDA	<MDA
Tl-208	2.44E-01	5.52E-02	<MDA	<MDA
Bi-212	<MDA	<MDA	<MDA	<MDA
Pb-212	7.56E-01	1.08E-01	1.20E+00	1.68E-01
Bi-214	6.340E+00	8.98E-01	6.28E+00	1.79E+00
Pb-214	5.08E+00	7.26E-01	<MDA	<MDA
Ra-224	<MDA	<MDA	1.92E+00	1.18E+00
Ra-226	2.97E+00	1.04E+00	3.14E+00	1.44E+00
Ac-228	9.25E-01	2.29E-01	<MDA	<MDA
Th-228	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA

TABLE 3.
(Continued)

Analytical Parameter	EL# 6459		EL# 6460	
	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)
ITAS Alpha Spectroscopy Results				
Am-241	<MDA	<MDA	b	b
I-129	<MDA	<MDA	b	b
Pu-238	<MDA	<MDA	b	b
Pu-239/240	6.52E-03	7.88E-03	b	b
Ra-226	2.11E+00	6.28E-01	b	b
Ra-228	6.95E-01	1.37E-01	b	b
Sr-90	6.29E-02	7.82E-02	b	b
Th-228	1.28E+00	1.52E-01	b	b
Th-230	2.05E+00	2.26E-01	b	b
Th-232	1.26E+00	1.49E-01	b	b
U-234	1.06E+00	2.51E-01	b	b
U-235	6.51E-02	5.01E-02	b	b
U-238	1.19E+00	2.72E-01	b	b

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 4
ANALYTICAL RESULTS FOR LIQUID EFFLUENT SAMPLES

Analytical Parameter	EL# 6777A		EL# 6777B		EL# 6777C	
	Result ($\mu\text{Ci/mL}$)	2σ ($\mu\text{Ci/mL}$)	Result ($\mu\text{Ci/mL}$)	2σ ($\mu\text{Ci/mL}$)	Result ($\mu\text{Ci/mL}$)	2σ ($\mu\text{Ci/mL}$)
Gross α	1.005E-09	1.025E-09	1.992E-08	3.912E-09	3.217E-08	8.027E-09
Gross β	3.593E-09	9.644E-10	2.197E-07	5.358E-09	6.681E-08	3.503E-09
RAL Gamma Spectroscopy Results						
Be-7	<MDA ^a	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	<MDA	<MDA	<MDA	<MDA	2.479E-08	1.835E-08
Co-60	<MDA	<MDA	4.013E-09	1.470E-09	<MDA	<MDA
Nb-94	NA ^b	NA	NA	NA	NA	NA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	<MDA	<MDA	1.562E-07	3.920E-09	<MDA	<MDA
Ce-139	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Eu-154	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Bi-212	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pb-212	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Bi-214	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pb-214	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Ra-224	NA	NA	NA	NA	NA	NA
Ra-226	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Ac-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-228	NA	NA	NA	NA	NA	NA
Th-234	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	NA	NA	NA	NA	NA	NA

TABLE 4
(Continued)

Analytical Parameter	EL# 6777A		EL# 6777B		EL# 6777C	
	Result ($\mu\text{Ci}/\text{mL}$)	2σ ($\mu\text{Ci}/\text{mL}$)	Result ($\mu\text{Ci}/\text{mL}$)	2σ ($\mu\text{Ci}/\text{mL}$)	Result ($\mu\text{Ci}/\text{mL}$)	2σ ($\mu\text{Ci}/\text{mL}$)
ITAS Alpha Spectroscopy Results						
Am-241	NA	NA	NA	NA	NA	NA
I-129	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pu-238	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pu-239/240	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Ra-226	2.9E-09	7.7E-10	2.4E-09	7.3E-10	3.20E-09	1.09E-09
Ra-228	<MDA	<MDA	1.1E-08	3.1E-09	<MDA	<MDA
Sr-90	<MDA	<MDA	2.2E-08	3.4E-09	<MDA	<MDA
Th-228	NA	NA	NA	NA	NA	NA
Th-230	2.0E-09	7.5E-10	7.5E-10	4.1E-10	3.0E-09	9.0E-10
Th-232	<MDA	<MDA	<MDA	<MDA	8.2E-10	4.6E-10
U-234	<MDA	<MDA	2.47E-09	1.53E-09	3.2E-09	5.8E-10
U-235	<MDA	<MDA	2.78E-09	1.35E-09	<MDA	<MDA
U-238	<MDA	<MDA	4.06E-09	1.81E-09	3.4E-09	6.0E-10

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b NA indicates sample not analyzed for that parameter

TABLE 4
(Continued)

		EL# 6777D		EL# 6777E	
Analytical Parameter	Result ($\mu\text{Ci/mL}$)	2σ ($\mu\text{Ci/mL}$)	Result ($\mu\text{Ci/mL}$)	2σ ($\mu\text{Ci/mL}$)	
Gross α	2.424E-08	5.870E-09	1.786E-09	2.219E-09	
Gross β	5.173E-08	2.956E-09	3.980E-09	1.172E-09	
RAL Gamma Spectroscopy Results					
Be-7	<MDA ^a	<MDA	<MDA	<MDA	
K-40	<MDA	<MDA	<MDA	<MDA	
Co-60	<MDA	<MDA	<MDA	<MDA	
Nb-94	NA	NA	NA	NA	
Sb-125	<MDA	<MDA	<MDA	<MDA	
I-131	<MDA	<MDA	<MDA	<MDA	
Cs-134	<MDA	<MDA	<MDA	<MDA	
Cs-137	<MDA	<MDA	<MDA	<MDA	
Ce-139	<MDA	<MDA	<MDA	<MDA	
Eu-152	<MDA	<MDA	<MDA	<MDA	
Eu-154	<MDA	<MDA	<MDA	<MDA	
Tl-208	<MDA	<MDA	<MDA	<MDA	
Bi-212	<MDA	<MDA	<MDA	<MDA	
Pb-212	<MDA	<MDA	<MDA	<MDA	
Bi-214	<MDA	<MDA	<MDA	<MDA	
Pb-214	<MDA	<MDA	<MDA	<MDA	
Ra-224	NA	NA	NA	NA	
Ra-226	<MDA	<MDA	<MDA	<MDA	
Ac-228	<MDA	<MDA	<MDA	<MDA	
Th-228	NA	NA	NA	NA	
Th-234	<MDA	<MDA	<MDA	<MDA	
U-235	<MDA	<MDA	<MDA	<MDA	
Am-241	<MDA	<MDA	<MDA	<MDA	
Pa-234m	NA	NA	NA	NA	

TABLE 4
(Continued)

Analytical Parameter	EL# 6777D		EL# 6777E	
	Result ($\mu\text{Ci}/\text{mL}$)	2σ ($\mu\text{Ci}/\text{mL}$)	Result ($\mu\text{Ci}/\text{mL}$)	2σ ($\mu\text{Ci}/\text{mL}$)
ITAS Alpha spectroscopy results				
Am-241	NA	NA	NA	NA
I-129	<MDA	<MDA	<MDA	<MDA
Pu-238	<MDA	<MDA	<MDA	<MDA
Pu-239/240	<MDA	<MDA	3.9E-10	2.7E-10
Ra-226	2.5E-09	7.1E-10	1.7E-09	6.0E-10
Ra-228	<MDA	<MDA	<MDA	<MDA
Sr-90	<MDA	<MDA	<MDA	<MDA
Th-228	NA	NA	NA	NA
Th-230	2.71E-09	1.43E-09	2.1E-09	7.0E-10
Th-232	<MDA	<MDA	<MDA	<MDA
U-234	1.1E-09	8.1E-10	1.8E-09	2.6E-10
U-235	<MDA	<MDA	1.7E-10	7.0E-11
U-238	1.3E-09	8.4E-10	1.6E-09	2.4E-10

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b NA indicates sample not analyzed for that parameter

TABLE 5.
ANALYTICAL RESULTS FOR SOIL SAMPLES FROM SS-SD-1

		EL# 6380		EL# 6381		EL# 6382	
Analytical Parameter	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	
Gross α	1.22E+01	1.01E+01	2.21E+01	1.36E+01	1.22E+01	1.36E+01	
Gross β	3.46E+01	5.27E+00	2.63E+01	4.59E+00	3.38E+01	4.59E+00	
RAL Gamma Spectroscopy Results							
Be-7	<MDA ^a	<MDA	<MDA	<MDA	<MDA	<MDA	
K-40	4.49E+00	1.11E+00	8.12E+00	1.61E+00	8.71E+00	1.69E+00	
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Cs-137	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Tl-208	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Bi-212	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Pb-212	<MDA	<MDA	9.11E-01	1.52E-01	<MDA	<MDA	
Bi-214	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Pb-214	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Ra-224	<MDA	<MDA	3.35E+00	1.22E+00	<MDA	<MDA	
Ra-226	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Ac-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Th-234	<MDA	<MDA	3.26E+00	1.42E+00	2.88E+00	1.60E+00	
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	

TABLE 5.
(Continued)

Analytical Parameter	EL# 6380		EL# 6381		EL# 6382	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
ITAS Alpha spectroscopy results						
Am-241	b	b	b	b	b	b
I-129	b	b	b	b	b	b
Pu-238	b	b	b	b	b	b
Pu-239/240	b	b	b	b	b	b
Ra-226	b	b	b	b	b	b
Ra-228	b	b	b	b	b	b
Sr-90	b	b	b	b	b	b
Th-228	b	b	b	b	b	b
Th-230	b	b	b	b	b	b
Th-232	b	b	b	b	b	b
U-234	b	b	b	b	b	b
U-235	b	b	b	b	b	b
U-238	b	b	b	b	b	b

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 5.
(Continued)

	EL# 6383		EL# 6384		EL# 6385	
Analytical Parameter	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	2.48E+01	1.45E+01	2.84E+01	1.55E+01	1.76E+01	1.22E+01
Gross β	3.91E+01	5.60E+00	2.66E+01	4.62E+00	3.18E+01	5.06E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.41E+01	1.69E+00	<MDA	<MDA	1.14E+01	1.52E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	1.31E+01	1.31E+00	<MDA	<MDA	2.66E+00	2.84E-01
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	2.72E-01	8.47E-02	2.78E-01	1.11E-01	3.24E-01	7.26E-02
Bi-212	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pb-212	7.93E-01	1.51E-01	8.55E-01	1.43E-01	7.92E-01	1.35E-01
Bi-214	1.09E+01	1.35E+00	<MDA	<MDA	1.10E+01	1.33E+00
Pb-214	8.48E+00	1.31E+00	<MDA	<MDA	8.66E+00	1.13E+00
Ra-224	<MDA	<MDA	3.44E+00	1.20E+00	1.49E+00	9.90E-01
Ra-226	3.98E+00	1.88E+00	<MDA	<MDA	3.76E+00	1.08E+00
Ac-228	9.03E-01	2.01E-01	<MDA	<MDA	1.05E+00	3.15E-01
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 5.
(Continued)

Analytical Parameter	EL# 6383		EL# 6384		EL# 6385	
	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)
ITAS Alpha spectroscopy results						
Am-241	b	b	b	b	b	b
I-129	b	b	b	b	b	b
Pu-238	b	b	b	b	b	b
Pu-239/240	b	b	b	b	b	b
Ra-226	b	b	b	b	b	b
Ra-228	b	b	b	b	b	b
Sr-90	b	b	b	b	b	b
Th-228	b	b	b	b	b	b
Th-230	b	b	b	b	b	b
Th-232	b	b	b	b	b	b
U-234	b	b	b	b	b	b
U-235	b	b	b	b	b	b
U-238	b	b	b	b	b	b

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 5.
(Continued)

Analytical Parameter	EL# 6386		EL# 6387		EL# 6388	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	2.21E+01	1.36E+01	2.66E+01	1.50E+01	1.67E+01	1.19E+01
Gross β	3.19E+01	5.06E+00	2.96E+01	4.88E+00	3.34E+01	5.18E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.55E+01	2.00E+00	1.32E+01	1.70E+00	1.45E+01	1.91E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	7.04E-01	1.07E-01	2.59E-01	6.14E-02	<MDA	<MDA
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	<MDA	<MDA	3.42E-01	7.80E-02	2.79E-01	7.70E-02
Bi-212	<MDA	<MDA	1.35E+00	6.80E-01	<MDA	<MDA
Pb-212	9.99E-01	1.58E-01	8.44E-01	1.77E-01	1.09E+00	1.76E-01
Bi-214	1.09E+01	1.40E+00	1.21E+01	1.44E+00	1.13E+01	1.46E+00
Pb-214	<MDA	<MDA	9.367E+00	1.14E+00	<MDA	<MDA
Ra-224	3.92E+00	1.30E+00	<MDA	<MDA	3.77E+00	1.40E+00
Ra-226	<MDA	<MDA	4.02E+00	1.13E+00	<MDA	<MDA
Ac-228	9.41E-01	2.27E-01	1.09E+00	2.71E-01	1.04E+00	2.74E-01
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 5.
(Continued)

Analytical Parameter	EL# 6386		EL# 6387		EL# 6388	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
ITAS Alpha spectroscopy results						
Am-241	<MDA	<MDA	<MDA	<MDA	b	b
I-129	<MDA	<MDA	<MDA	<MDA	b	b
Pu-238	8.43E-03	1.08E-02	<MDA	<MDA	b	b
Pu-239/240	<MDA	<MDA	<MDA	<MDA	b	b
Ra-226	2.83E+00	5.49E-01	2.57E+00	5.31E-01	b	b
Ra-228	6.80E-01	1.34E-01	7.36E-01	1.61E-01	b	b
Sr-90	7.88E-02	7.59E-02	6.22E-02	7.28E-02	b	b
Th-228	8.62E-01	1.02E-01	8.96E-01	1.05E-01	b	b
Th-230	1.92E+00	2.01E-01	1.96E+00	2.04E-01	b	b
Th-232	7.58E-01	9.13E-02	8.16E-01	9.61E-02	b	b
U-234	1.09E+00	2.55E-01	1.25E+00	2.91E-01	b	b
U-235	5.62E-02	4.66E-02	<MDA	<MDA	b	b
U-238	1.35E+00	2.96E-01	1.17E+00	2.77E-01	b	b

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 5.
(Continued)

EL# 6389		EL# 6390		EL# 6391		
Analytical Parameter	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	1.76E+01	1.22E+01	2.84E+01	1.55E+01	3.20E+01	1.64E+01
Gross β	3.16E+01	5.03E+00	2.95E+01	4.86E+00	3.11E+01	5.00E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.12E+01	1.47E+00	1.63E+01	2.08E+00	1.16E+01	1.66E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	3.94E+00	4.09E-01	1.78E+00	2.15E-01	4.98E-01	7.78E-02
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	3.26E-01	8.87E-02	<MDA	<MDA	3.02E-01	7.99E-02
Bi-212	1.45E+00	7.26E-01	<MDA	<MDA	<MDA	<MDA
Pb-212	7.08E-01	1.13E-01	<MDA	<MDA	9.99E-01	1.50E-01
Bi-214	<MDA	<MDA	1.11E+01	1.43E+00	1.32E+01	1.57E+00
Pb-214	7.28E+00	1.03E+00	<MDA	<MDA	1.05E+01	1.35E+00
Ra-224	<MDA	<MDA	<MDA	<MDA	2.07E+00	9.76E-01
Ra-226	3.45E+00	1.07E+00	4.52E+00	1.36E+00	4.45E+00	1.30E+00
Ac-228	8.58E-01	2.12E-01	<MDA	<MDA	1.08E+00	2.11E-01
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	2.54E+00	1.56E+00	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 5.
(Continued)

Analytical Parameter	EL# 6389		EL# 6390		EL# 6391	
	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)
ITAS Alpha spectroscopy results						
Am-241	b	b	<MDA	<MDA	9.23E-03	7.26E-03
I-129	b	b	<MDA	<MDA	<MDA	<MDA
Pu-238	b	b	<MDA	<MDA	<MDA	<MDA
Pu-239/240	b	b	<MDA	<MDA	<MDA	<MDA
Ra-226	b	b	2.74E+00	5.69E-01	3.01E+00	5.66E-01
Ra-228	b	b	7.81E-01	1.38E-01	8.21E-01	1.46E-01
Sr-90	b	b	2.52E-01	1.07E-01	6.74E-02	8.01E-02
Th-228	b	b	9.22E-01	1.10E-01	1.16E+00	1.34E-01
Th-230	b	b	2.08E+00	2.20E-01	2.88E+00	2.96E-01
Th-232	b	b	8.49E-01	1.02E-01	1.11E+00	1.28E-01
U-234	b	b	1.28E+00	2.74E-01	8.65E-01	2.26E-01
U-235	b	b	5.31E-02	4.25E-02	5.35E-02	4.68E-02
U-238	b	b	1.22E+00	2.65E-01	1.05E+00	2.57E-01

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 5.
(Continued)

	EL# 6392		EL# 6393		EL# 6394	
Analytical Parameter	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	1.40E+01	8.53E+00	8.60E+00	1.15E+01	1.58E+01	1.15E+01
Gross β	1.58E+01	4.61E+00	2.64E+01	4.94E+00	3.04E+01	4.77E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	7.05E+00	1.27E+00	1.08E+01	1.45E+00	1.73E+01	1.97E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	1.90E+00	2.23E-01	2.86E+00	3.05E-01	9.49E-01	1.30E-01
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	<MDA	<MDA	2.58E-01	8.09E-02	3.26E-01	6.99E-02
Bi-212	<MDA	<MDA	<MDA	<MDA	1.59E+00	7.90E-01
Pb-212	<MDA	<MDA	7.71E-01	1.32E-01	9.10E-01	2.05E-01
Bi-214	8.48E+00	1.17E+00	1.04E+01	1.28E+00	<MDA	<MDA
Pb-214	<MDA	<MDA	8.37E+00	1.05E+00	1.02E+01	1.28E+00
Ra-224	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Ra-226	3.50E+00	1.66E+00	3.03E+00	1.55E+00	5.07E+00	1.99E+00
Ac-228	5.71E-01	1.88E-01	8.43E-01	1.99E-01	1.13E+00	2.07E-01
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	<MDA	<MDA	3.79E+00	1.65E+00
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 5.
(Continued)

Analytical Parameter	EL# 6392		EL# 6393		EL# 6394	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
ITAS Alpha spectroscopy results						
Am-241	<MDA	<MDA	<MDA	<MDA	b	b
I-129	<MDA	<MDA	<MDA	<MDA	b	b
Pu-238	<MDA	<MDA	<MDA	<MDA	b	b
Pu-239/240	<MDA	<MDA	<MDA	<MDA	b	b
Ra-226	1.77E+00	4.96E-01	2.44E+00	5.93E-01	b	b
Ra-228	5.01E-01	1.13E-01	7.68E-01	1.26E-01	b	b
Sr-90	6.62E-02	8.06E-02	7.47E-02	7.76E-02	b	b
Th-228	7.19E-01	9.12E-02	1.07E+00	1.24E-01	b	b
Th-230	1.84E+00	1.99E-01	2.58E+00	2.66E-01	b	b
Th-232	6.56E-01	8.40E-02	9.03E-01	1.07E-01	b	b
U-234	9.29E-01	2.78E-01	1.21E+00	2.68E-01	b	b
U-235	<MDA	<MDA	<MDA	<MDA	b	b
U-238	1.09E+00	3.10E-01	1.40E+00	2.98E-01	b	b

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 5.
(Continued)

Analytical Parameter	EL# 6395		EL# 6396		EL# 6397	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	1.58E+01	1.15E+01	2.75E+01	1.52E+01	1.49E+01	1.12E+01
Gross β	2.84E+01	4.77E+00	3.30E+01	5.15E+00	3.10E+01	4.98E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.58E+01	1.86E+00	1.38E+01	1.98E+00	1.73E+01	2.02E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	2.27E+00	2.55E-01	1.56E-01	6.35E-02	7.68E-02	4.99E-02
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	2.80E-01	7.26E-02	<MDA	<MDA	3.83E-01	7.65E-02
Bi-212	1.57E+00	9.75E-01	<MDA	<MDA	2.05E+00	9.67E-01
Pb-212	8.42E-01	1.68E-01	<MDA	<MDA	9.07E-01	1.68E-01
Bi-214	1.21E+01	2.64E+00	1.16E+01	1.49E+00	1.28E+01	1.50E+00
Pb-214	9.56E+00	1.26E+00	<MDA	<MDA	9.98E+00	1.24E+00
Ra-224	2.04E+00	1.42E+00	<MDA	<MDA	<MDA	<MDA
Ra-226	4.90E+00	2.14E+00	<MDA	<MDA	4.38E+00	1.39E+00
Ac-228	9.32E-01	2.10E-01	<MDA	<MDA	1.10E+00	2.05E-01
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	1.90E+00	9.35E-01	2.64E+00	1.57E+00	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 5.
(Continued)

Analytical Parameter	EL# 6395		EL# 6396		EL# 6397	
	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)
ITAS Alpha spectroscopy results						
Am-241	b	b	b	b	b	b
I-129	b	b	b	b	b	b
Pu-238	b	b	b	b	b	b
Pu-239/240	b	b	b	b	b	b
Ra-226	b	b	b	b	b	b
Ra-228	b	b	b	b	b	b
Sr-90	b	b	b	b	b	b
Th-228	b	b	b	b	b	b
Th-230	b	b	b	b	b	b
Th-232	b	b	b	b	b	b
U-234	b	b	b	b	b	b
U-235	b	b	b	b	b	b
U-238	b	b	b	b	b	b

a

<MDA indicates sample result for specific parameter was less than the minimum detectable activity.

b

Sample not selected for alpha spectroscopy.

TABLE 5.
(Continued)

Analytical Parameter	EL# 6398		EL# 6399		EL# 6400	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	2.21E+01	1.36E+01	2.48E+01	1.45E+01	2.48E+01	1.45E+01
Gross β	3.27E+01	5.12E+00	3.34E+01	5.17E+00	2.14E+01	4.15E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.30E+01	1.64E+00	1.93E+01	2.21E+00	5.06E+00	1.12E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	5.08E-01	8.17E-02	1.66E-01	5.52E-02	4.25E-01	7.96E-02
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	2.78E-01	7.06E-02	3.28E-01	1.12E-01	<MDA	<MDA
Bi-212	1.35E+00	9.43E-01	<MDA	<MDA	<MDA	<MDA
Pb-212	8.81E-01	1.80E-01	1.10E+00	1.87E-01	4.58E-01	9.72E-02
Bi-214	<MDA	<MDA	1.54E+01	3.08E+00	7.40E+00	1.63E+00
Pb-214	8.30E+00	1.04E+00	1.14E+01	1.55E+00	<MDA	<MDA
Ra-224	<MDA	<MDA	2.73E+00	1.54E+00	2.32E+00	8.70E-01
Ra-226	4.01E+00	1.62E+00	6.02E+00	2.02E+00	<MDA	<MDA
Ac-228	9.62E-01	2.42E-01	1.13E+00	2.43E-01	5.31E-01	1.57E-01
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	1.78E+00	9.64E-01	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 5.
(Continued)

Analytical Parameter	EL# 6398		EL# 6399		EL# 6400	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
ITAS Alpha spectroscopy results						
Am-241	<MDA	<MDA	5.98E-03	6.36E-03	b	b
I-129	<MDA	<MDA	<MDA	<MDA	b	b
Pu-238	<MDA	<MDA	<MDA	<MDA	b	b
Pu-239/240	6.27E-03	6.29E-03	<MDA	<MDA	b	b
Ra-226	2.97E+00	6.34E-01	3.08E+00	6.15E-01	b	b
Ra-228	7.35E-01	1.54E-01	1.08E+00	1.73E-01	b	b
Sr-90	5.27E-02	7.22E-02	<MDA	<MDA	b	b
Th-228	9.38E-01	1.12E-01	1.4E+00	1.57E-01	b	b
Th-230	2.07E+00	2.20E-01	3.19E+00	3.26E-01	b	b
Th-232	8.94E-01	1.07E-01	1.35E+00	1.51E-01	b	b
U-234	1.09E+00	2.82E-01	1.12E+00	4.16E-01	b	b
U-235	3.58E-02	4.38E-02	<MDA	<MDA	b	b
U-238	1.19E+00	2.98E-01	7.9E-01	3.3E-01	b	b

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 5.
(Continued)

EL# 6401		
Analytical Parameter	Result (pCi/g)	2 σ (pCi/g)
Gross α	2.39E+01	1.42E+01
Gross β	2.18E+01	4.18E+00
RAL Gamma Spectroscopy Results		
Be-7	<MDA	<MDA
K-40	8.76E+00	1.17E+00
Co-60	8.41E-02	3.15E-02
Nb-94	<MDA	<MDA
Sb-125	<MDA	<MDA
I-131	<MDA	<MDA
Cs-134	<MDA	<MDA
Cs-137	1.90E-01	4.47E-02
Eu-152	<MDA	<MDA
Tl-208	1.53E-01	5.61E-02
Bi-212	1.01E+00	7.12E-01
Pb-212	5.46E-01	1.23E-01
Bi-214	7.78E+00	1.77E+00
Pb-214	5.57E+00	7.35E-01
Ra-224	<MDA	<MDA
Ra-226	3.13E+00	1.25E+00
Ac-228	5.04E-01	1.54E-01
Th-228	<MDA	<MDA
Th-234	<MDA	<MDA
U-235	<MDA	<MDA
Am-241	<MDA	<MDA
Pa-234m	<MDA	<MDA

TABLE 5.
(Continued)

EL# 6401		
Analytical Parameter	Result (pCi/g)	2 σ (pCi/g)
ITAS Alpha spectroscopy results		
Am-241	b	b
I-129	b	b
Pu-238	b	b
Pu-239/240	b	b
Ra-226	b	b
Ra-228	b	b
Sr-90	b	b
Th-228	b	b
Th-230	b	b
Th-232	b	b
U-234	b	b
U-235	b	b
U-238	b	b

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 6.
ANALYTICAL RESULTS FOR SOIL SAMPLES FROM SS-JN2-1

Analytical Parameter	EL# 6267		EL# 6268		EL# 6269	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	7.2E+00	7.8E+00	2.7E+00	5.5E+00	1.08E+01	9.49E+00
Gross β	2.56E+01	4.53E+00	2.58E+01	4.55E+00	3.1E+01	5.0E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA ^a	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.15E+01	1.80E+00	1.22E+01	1.56E+00	1.53E+01	1.96E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	7.91E-02	3.65E-02	<MDA	<MDA	<MDA	<MDA
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	2.00E-01	4.46E-02	2.86E-01	7.05E-02	3.36E-01	8.81E-02
Bi-212	<MDA	<MDA	2.13E+00	1.20E+00	<MDA	<MDA
Pb-212	8.02E-01	1.13E-01	8.21E-01	1.20E-01	<MDA	<MDA
Bi-214	4.52E+00	6.60E-01	8.09E+00	1.78E+00	9.84E+00	2.23E+00
Pb-214	3.62E+00	5.34E-01	5.22E+00	6.83E-01	<MDA	<MDA
Ra-224	1.49E+00	5.75E-01	1.15E+00	7.85E-01	<MDA	<MDA
Ra-226	2.74E+00	7.52E-01	2.56E+00	1.02E+00	2.95E+00	1.97E+00
Ac-228	9.03E-01	2.91E-01	9.28E-01	1.61E-01	<MDA	<MDA
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	1.38E+00	5.16E-01	<MDA	<MDA	1.82E+00	1.35E+00
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 6.
(Continued)

Analytical Parameter	EL# 6267		EL# 6268		EL# 6269	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	b	b	b	b	b	b
I-129	b	b	b	b	b	b
Pu-238	b	b	b	b	b	b
Pu-239/240	b	b	b	b	b	b
Ra-226	b	b	b	b	b	b
Ra-228	b	b	b	b	b	b
Sr-90	b	b	b	b	b	b
Th-228	b	b	b	b	b	b
Th-230	b	b	b	b	b	b
Th-232	b	b	b	b	b	b
U-234	b	b	b	b	b	b
U-235	b	b	b	b	b	b
U-238	b	b	b	b	b	b

a

<MDA indicates sample result for specific parameter was less than the minimum detectable activity.

b

Sample not selected for alpha spectroscopy.

TABLE 6.
(Continued)

Analytical Parameter	EL# 6270		EL# 6271		EL# 6272	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	9.8E+00	9.1E+00	1.62E+01	1.17E+01	1.52E+01	1.13E+01
Gross β	2.47E+01	4.44E+00	2.31E+01	4.31E+00	2.36E+01	4.35E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.34E+01	1.65E+00	1.39E+01	1.81E+00	1.45E+01	1.72E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	1.53E-01	4.97E-02	<MDA	<MDA	<MDA	<MDA
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	2.48E-01	5.41E-02	<MDA	<MDA	2.57E-01	6.25E-02
Bi-212	1.22E+00	8.23E-01	<MDA	<MDA	1.40E+00	8.01E-01
Pb-212	7.24E-01	1.12E-01	8.36E-01	1.30E-01	7.29E-01	1.14E-01
Bi-214	<MDA	<MDA	6.92E+00	9.64E-01	7.51E+00	1.75E+00
Pb-214	4.61E+00	6.98E-01	<MDA	<MDA	5.33E+00	7.09E-01
Ra-224	1.02E+00	7.67E-01	2.36E+00	1.01E+00	<MDA	<MDA
Ra-226	<MDA	<MDA	<MDA	<MDA	2.68E+00	8.31E-01
Ac-228	8.67E-01	1.87E-01	<MDA	<MDA	8.17E-01	1.96E-01
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	2.12E+00	1.30E+00	3.89E+00	1.73E+00
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 6.
(Continued)

Analytical Parameter	EL# 6270		EL# 6271		EL# 6272	
	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	<MDA	<MDA	4.93E-03	5.02E-03	<MDA	<MDA
I-129	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pu-238	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pu-239/240	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Ra-226	1.44E+00	4.30E-01	1.90E+00	4.29E-01	1.79E+00	3.66E-01
Ra-228	6.17E-01	1.42E-01	6.0E-01	1.18E-01	6.08E-01	1.30E-01
Sr-90	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-228	7.64E-01	9.38E-02	8.22E-01	1.02E-01	6.97E-01	8.77E-02
Th-230	1.07E+00	1.22E-01	1.37E+00	1.54E-01	1.2E+00	1.35E-01
Th-232	7.05E-01	8.71E-02	8.31E-01	1.02E-01	6.75E-01	8.47E-02
U-234	9.06E-01	2.17E-01	1.07E+00	2.90E-01	1.06E+00	2.47E-01
U-235	<MDA	<MDA	6.41E-02	5.91E-02	5.55E-02	4.49E-02
U-238	9.52E-01	2.24E-01	1.22E+00	3.16E-01	1.05E+00	2.45E-01

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 6.
(Continued)

EL# 6273		EL# 6274		EL# 6275		
Analytical Parameter	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	9.8E+00	9.1E+00	1.89E+01	1.26E+01	1.53E+01	1.13E+01
Gross β	2.58E+01	4.53E+00	2.39E+01	4.39E+00	2.38E+01	4.37E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.46E+01	1.85E+00	1.44E+01	1.87E+00	1.22E+01	1.56E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	1.69E-01	5.72E-02	<MDA	<MDA	<MDA	<MDA
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	<MDA	<MDA	<MDA	<MDA	2.34E-01	6.30E-02
Bi-212	<MDA	<MDA	<MDA	<MDA	1.48E+00	6.56E-01
Pb-212	7.75E-01	1.17E-01	<MDA	<MDA	7.87E-01	1.16E-01
Bi-214	5.40E+00	8.03E-01	5.87E+00	8.59E-01	6.39E+00	8.42E-01
Pb-214	<MDA	<MDA	<MDA	<MDA	5.09E+00	6.73E-01
Ra-224	2.04E+00	9.17E-01	<MDA	<MDA	1.47E+00	7.78E-01
Ra-226	<MDA	<MDA	<MDA	<MDA	2.61E+00	9.80E-01
Ac-228	<MDA	<MDA	<MDA	<MDA	7.47E-01	1.56E-01
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	2.70E+00	1.14E+00	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 6.
(Continued)

Analytical Parameter	EL# 6273		EL# 6274		EL# 6275	
	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	b	b	b	b	<MDA	<MDA
I-129	b	b	b	b	<MDA	<MDA
Pu-238	b	b	b	b	<MDA	<MDA
Pu-239/240	b	b	b	b	<MDA	<MDA
Ra-226	b	b	b	b	1.80E+00	4.41E-01
Ra-228	b	b	b	b	6.28E-01	1.16E-01
Sr-90	b	b	b	b	<MDA	<MDA
Th-228	b	b	b	b	7.21E-01	8.93E-02
Th-230	b	b	b	b	1.04E+00	1.19E-01
Th-232	b	b	b	b	6.60E-01	8.24E-02
U-234	b	b	b	b	9.82E-01	2.47E-01
U-235	b	b	b	b	4.46E-02	4.31E-02
U-238	b	b	b	b	9.00E-01	2.32E-01

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 6.
(Continued)

		EL# 6276		EL# 6277		EL# 6278	
Analytical Parameter	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	
Gross α	9.8E+00	9.09E+00	1.8E+01	1.2E+01	1.25E+01	1.02E+01	
Gross β	2.44E+01	4.42E+00	2.4E+01	4.39E+00	2.34E+01	4.32E+00	
RAL Gamma Spectroscopy Results							
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
K-40	1.07E+01	1.49E+00	1.08E+01	1.50E+00	1.46E+01	1.89E+00	
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Cs-137	1.32E-01	4.08E-02	<MDA	<MDA	<MDA	<MDA	
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Tl-208	2.67E-01	5.88E-02	2.54E-01	5.73E-02	<MDA	<MDA	
Bi-212	1.38E+00	7.00E-01	1.35E+00	8.39E-01	<MDA	<MDA	
Pb-212	8.02E-01	1.19E-01	6.66E-01	1.20E-01	<MDA	<MDA	
Bi-214	7.11E+00	1.61E+00	6.75E+00	8.77E-01	7.96E+00	1.96E+00	
Pb-214	4.42E+00	5.84E-01	4.89E+00	7.39E-01	<MDA	<MDA	
Ra-224	1.46E+00	7.87E-01	<MDA	<MDA	<MDA	<MDA	
Ra-226	2.16E+00	8.96E-01	2.76E+00	9.95E-01	3.36E+00	1.45E+00	
Ac-228	7.77E-01	1.70E-01	8.06E-01	1.75E-01	<MDA	<MDA	
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Th-234	<MDA	<MDA	<MDA	<MDA	2.08E+00	1.35E+00	
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	

TABLE 6.
(Continued)

Analytical Parameter	EL# 6276		EL# 6277		EL# 6278	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	b	b	b	b	b	b
I-129	b	b	b	b	b	b
Pu-238	b	b	b	b	b	b
Pu-239/240	b	b	b	b	b	b
Ra-226	b	b	b	b	b	b
Ra-228	b	b	b	b	b	b
Sr-90	b	b	b	b	b	b
Th-228	b	b	b	b	b	b
Th-230	b	b	b	b	b	b
Th-232	b	b	b	b	b	b
U-234	b	b	b	b	b	b
U-235	b	b	b	b	b	b
U-238	b	b	b	b	b	b

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 6.
(Continued)

EL# 6279		EL# 6280		EL# 6281		
Analytical Parameter	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	1.26E+01	1.03E+01	1.44E+01	1.10E+01	1.62E+01	1.17E+01
Gross β	2.14E+01	4.15E+00	2.75E+01	4.70E+00	2.52E+01	4.50E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.25E+01	1.57E+00	1.52E+01	1.94E+00	1.58E+01	1.84E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	3.50E-01	6.31E-02	<MDA	<MDA	5.20E-02	3.64E-02
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	2.09E-01	4.93E-02	<MDA	<MDA	2.34E-01	5.45E-02
Bi-212	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pb-212	6.73E-01	1.40E-01	9.06E-01	1.41E-01	7.30E-01	1.13E-01
Bi-214	6.04E+00	8.37E-01	9.65E+00	2.47E+00	7.30E+00	1.54E+00
Pb-214	4.66E+00	6.60E-01	<MDA	<MDA	5.04E+00	6.87E-01
Ra-224	<MDA	<MDA	2.71E+01	1.11E+00	1.03E+00	7.80E-01
Ra-226	2.05E+00	1.24E+00	<MDA	<MDA	3.02E+00	1.35E+00
Ac-228	7.64E-01	1.69E-01	<MDA	<MDA	8.10E-01	1.79E-01
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	2.11E+00	1.34E+00	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 6.
(Continued)

Analytical Parameter	EL# 6279		EL# 6280		EL# 6281	
	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	b	b	b	b	<MDA	<MDA
I-129	b	b	b	b	<MDA	<MDA
Pu-238	b	b	b	b	<MDA	<MDA
Pu-239/240	b	b	b	b	<MDA	<MDA
Ra-226	b	b	b	b	1.65E+00	5.35E-01
Ra-228	b	b	b	b	4.87E-01	1.34E-01
Sr-90	b	b	b	b	5.58E-02	7.17E-02
Th-228	b	b	b	b	1.22E+00	1.41E-01
Th-230	b	b	b	b	1.69E+00	1.86E-01
Th-232	b	b	b	b	1.19E+00	1.37E-01
U-234	b	b	b	b	1.14E+00	4.34E-01
U-235	b	b	b	b	<MDA	<MDA
U-238	b	b	b	b	1.10E+00	4.22E-01

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 6.
(Continued)

Analytical Parameter	EL# 6282		EL# 6283		EL# 6284	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	1.62E+01	1.17E+01	1.44E+01	1.10E+01	1.89E+01	1.26E+01
Gross β	2.64E+01	4.61E+00	2.24E+01	4.25E+00	1.99E+01	3.99E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.39E+01	1.82E+00	1.56E+01	1.84E+00	1.19E+01	1.74E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	2.25E-01	6.63E-02	<MDA	<MDA	<MDA	<MDA
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	<MDA	<MDA	2.39E-01	7.48E-02	<MDA	<MDA
Bi-212	<MDA	<MDA	1.39E+00	8.68E-01	<MDA	<MDA
Pb-212	9.07E-01	1.36E-01	7.96E-01	1.23E-01	7.06E-01	1.20E-01
Bi-214	7.12E+00	9.96E-01	9.46E+00	1.92E+00	<MDA	<MDA
Pb-214	<MDA	<MDA	6.41E+00	7.90E-01	<MDA	<MDA
Ra-224	2.54E+00	1.04E+00	1.20E+00	8.83E-01	2.41E+00	9.65E-01
Ra-226	<MDA	<MDA	3.01E+00	9.57E-01	<MDA	<MDA
Ac-228	<MDA	<MDA	8.15E-01	1.81E-01	<MDA	<MDA
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 6.
(Continued)

Analytical Parameter	EL# 6282		EL# 6283		EL# 6284	
	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	b	b	b	b	b	b
I-129	b	b	b	b	b	b
Pu-238	b	b	b	b	b	b
Pu-239/240	b	b	b	b	b	b
Ra-226	b	b	b	b	b	b
Ra-228	b	b	b	b	b	b
Sr-90	b	b	b	b	b	b
Th-228	b	b	b	b	b	b
Th-230	b	b	b	b	b	b
Th-232	b	b	b	b	b	b
U-234	b	b	b	b	b	b
U-235	b	b	b	b	b	b
U-238	b	b	b	b	b	b

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 6.
(Continued)

Analytical Parameter	EL# 6285		EL# 6286		EL# 6287	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	1.53E+01	1.13E+01	1.62E+01	1.17E+01	1.08E+01	9.53E+00
Gross β	2.18E+01	4.18E+00	2.54E+01	4.51E+00	2.34E+01	4.33E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.44E+01	1.86E+00	1.17E+01	1.59E+00	1.45E+01	1.88E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	2.71E-01	6.37E-02	<MDA	<MDA	<MDA	<MDA
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	<MDA	<MDA	2.74E-01	6.31E-02	<MDA	<MDA
Bi-212	<MDA	<MDA	1.59E+00	1.05E+00	<MDA	<MDA
Pb-212	8.65E-01	1.30E-01	8.12E-01	1.25E-01	7.98E-01	1.21E-01
Bi-214	5.37E+00	8.13E-01	8.18E+00	1.85E+00	6.79E+00	1.86E+00
Pb-214	<MDA	<MDA	5.63E+00	7.52E-01	<MDA	<MDA
Ra-224	2.01E+00	9.88E-01	1.80E+00	8.83E-01	2.14E+00	9.43E-01
Ra-226	<MDA	<MDA	2.96E+00	9.51E-01	2.80E+00	1.27E+00
Ac-228	<MDA	<MDA	1.00E+00	2.31E-01	<MDA	<MDA
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 6.
(Continued)

Analytical Parameter	EL# 6285		EL# 6286		EL# 6287	
	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	b	b	2.41E-03	4.08E-03	b	b
I-129	b	b	<MDA	<MDA	b	b
Pu-238	b	b	<MDA	<MDA	b	b
Pu-239/240	b	b	<MDA	<MDA	b	b
Ra-226	b	b	1.75E+00	4.72E-01	b	b
Ra-228	b	b	6.65E-01	1.20E-01	b	b
Sr-90	b	b	<MDA	<MDA	b	b
Th-228	b	b	8.37E-01	1.05E-01	b	b
Th-230	b	b	1.43E+00	1.61E-01	b	b
Th-232	b	b	8.42E-01	1.04E-01	b	b
U-234	b	b	9.56E-01	2.41E-01	b	b
U-235	b	b	4.38E-02	4.24E-02	b	b
U-238	b	b	1.05E+00	2.57E-01	b	b

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 6.
(Continued)

Analytical Parameter	EL# 6288		EL# 6289		EL# 6290	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	1.89E+01	1.26E+01	1.08E+01	9.53E+00	2.3E+01	1.40E+01
Gross β	2.78E+01	4.73E+00	2.28E+01	4.29E+00	2.44E+01	4.43E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.30E+01	1.67E+00	1.57E+01	1.99E+00	1.36E+01	1.68E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	3.03E-01	5.84E-02	<MDA	<MDA	<MDA	<MDA
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	3.19E-01	7.21E-02	<MDA	<MDA	2.70E-01	6.35E-02
Bi-212	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pb-212	8.37E-01	1.28E-01	<MDA	<MDA	7.08E-01	1.31E-01
Bi-214	7.91E+00	1.02E+00	6.06E+00	8.69E-01	7.03E+00	1.58E+00
Pb-214	6.12E+00	8.20E-01	<MDA	<MDA	4.93E+00	7.06E-01
Ra-224	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Ra-226	2.84E+00	1.02E+00	2.64E+00	1.13E+00	2.43E+00	7.59E-01
Ac-228	9.19E-01	2.38E-01	<MDA	<MDA	8.52E-01	1.76E-01
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 6.
(Continued)

Analytical Parameter	EL# 6288		EL# 6289		EL# 6290	
	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	b	b	b	b	b	b
I-129	b	b	b	b	b	b
Pu-238	b	b	b	b	b	b
Pu-239/240	b	b	b	b	b	b
Ra-226	b	b	b	b	b	b
Ra-228	b	b	b	b	b	b
Sr-90	b	b	b	b	b	b
Th-228	b	b	b	b	b	b
Th-230	b	b	b	b	b	b
Th-232	b	b	b	b	b	b
U-234	b	b	b	b	b	b
U-235	b	b	b	b	b	b
U-238	b	b	b	b	b	b

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 7.
ANALYTICAL RESULTS FOR SOIL SAMPLES FROM SS-SD-2

Analytical Parameter	EL# 6416		EL# 6417	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	2.03E+01	1.31E+01	3.29E+01	1.66E+01
Gross β	3.20E+01	5.07E+00	3.29E+01	5.14E+00
RAL Gamma Spectroscopy Results				
Be-7	<MDA ^a	<MDA	<MDA	<MDA
K-40	9.05E+00	1.77E+00	1.70E+01	2.00E+00
Co-60	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA
Cs-137	<MDA	<MDA	3.71E-01	6.89E-02
Eu-152	<MDA	<MDA	<MDA	<MDA
Tl-208	<MDA	<MDA	3.77E-01	8.40E-02
Bi-212	2.79E+00	1.78E+00	1.52E+00	1.03E+00
Pb-212	1.09E+00	1.61E-01	1.04E+00	1.59E-01
Bi-214	1.08E+01	2.73E+00	9.07E+00	1.17E+00
Pb-214	<MDA	<MDA	7.34E+00	9.53E-01
Ra-224	3.06E+00	1.20E+00	<MDA	<MDA
Ra-226	<MDA	<MDA	3.43E+00	1.25E+00
Ac-228	<MDA	<MDA	1.21E+00	2.76E-01
Th-228	<MDA	<MDA	<MDA	<MDA
Th-234	2.31E+00	1.47E+00	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA

TABLE 7.
(Continued)

Analytical Parameter	EL# 6416		EL# 6417	
	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)
ITAS Alpha spectroscopy results				
Am-241	<MDA	<MDA	5.89E-03	5.35E-03
I-129	<MDA	<MDA	8.70E-01	4.28E-01
Pu-238	<MDA	<MDA	<MDA	<MDA
Pu-239/240	8.25E-03	7.33E-03	<MDA	<MDA
Ra-226	2.28E+00	5.55E-01	2.54E+00	5.28E-01
Ra-228	8.04E-01	1.44E-01	8.83E-01	1.58E-02
Sr-90	7.87E-02	7.57E-02	<MDA	<MDA
Th-228	9.12E-01	1.06E-01	1.28E+00	1.42E-01
Th-230	1.57E+00	1.67E-01	2.28E+00	2.35E-01
Th-232	8.90E-01	1.03E-01	1.20E+00	1.33E-01
U-234	1.14E+00	2.29E-01	1.25E+00	2.97E-01
U-235	3.72E-02	3.33E-02	1.08E-01	7.01E-02
U-238	1.08E+00	2.20E-01	8.99E-01	2.36E-01

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.

TABLE 8.
ANALYTICAL RESULTS FOR SOIL SAMPLES FROM SS-JN1-1

Analytical Parameter	EL# 6437		EL# 6438		EL# 6439	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	2.48E+01	1.45E+01	1.49E+01	1.12E+01	2.12E+01	1.34E+01
Gross β	3.76E+01	5.50E+00	3.46E+01	5.27E+00	3.34E+01	5.17E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA ^a	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.78E+01	2.05E+00	2.18E+01	2.47E+00	1.43E+01	1.85E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	7.63E-01	1.12E-01	<MDA	<MDA	3.96E-01	7.34E-02
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	3.29E-01	7.74E-02	4.08E-01	8.69E-02	3.66E-01	8.62E-02
Bi-212	2.00E+00	9.56E-01	1.92E+00	9.92E-01	1.35E+00	8.51E-01
Pb-212	1.03E+00	1.75E-01	1.35E+00	2.07E-01	9.68E-01	1.64E-01
Bi-214	<MDA	<MDA	9.35E+00	2.34E+00	9.23E+00	1.16E+00
Pb-214	7.94E+00	1.31E+00	6.61E+00	9.41E-01	7.12E+00	9.37E-01
Ra-224	<MDA	<MDA	2.94E+00	1.63E+00	<MDA	<MDA
Ra-226	3.98E+00	1.66E+00	3.59E+00	1.82E+00	3.67E+00	1.30E+00
Ac-228	1.24E+00	2.74E-01	1.21E+00	2.74E-01	1.31E+00	2.89E-01
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 8.
(Continued)

Analytical Parameter	EL# 6437		EL# 6438		EL# 6439	
	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	b	b	b	b	b	b
I-129	b	b	b	b	b	b
Pu-238	b	b	b	b	b	b
Pu-239/240	b	b	b	b	b	b
Ra-226	b	b	b	b	b	b
Ra-228	b	b	b	b	b	b
Sr-90	b	b	b	b	b	b
Th-228	b	b	b	b	b	b
Th-230	b	b	b	b	b	b
Th-232	b	b	b	b	b	b
U-234	b	b	b	b	b	b
U-235	b	b	b	b	b	b
U-238	b	b	b	b	b	b

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 8.
(Continued)

		EL# 6440		EL# 6441		EL# 6442	
Analytical Parameter	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	
Gross α	1.58E+01	1.15E+01	1.94E+01	1.28E+01	1.13E+01	9.77E+00	
Gross β	3.26E+01	5.12E+00	2.90E+01	4.83E+00	3.00E+01	4.91E+00	
RAL Gamma Spectroscopy Results							
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
K-40	1.90E+01	2.15E+00	1.91E+01	2.20E+00	2.52E+01	4.17E+00	
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Cs-137	1.47E-01	6.53E-02	3.92E-01	7.95E-02	<MDA	<MDA	
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Tl-208	3.68E-01	6.87E-02	3.65E-01	8.11E-02	4.69E-01	2.43E-01	
Bi-212	1.53E+00	1.11E+00	1.99E+00	1.13E+00	<MDA	<MDA	
Pb-212	1.08E+00	1.72E-01	<MDA	<MDA	1.41E+00	3.76E-01	
Bi-214	<MDA	<MDA	9.62E+00	2.29E+00	1.63E+01	5.18E+00	
Pb-214	6.38E+00	8.73E-01	6.75E+00	9.58E-01	4.53E+00	1.95E+00	
Ra-224	2.13E+00	1.25E+00	<MDA	<MDA	4.54E+00	2.97E+00	
Ra-226	3.59E+00	1.64E+00	4.01E+00	2.08E+00	<MDA	<MDA	
Ac-228	1.18E+00	2.09E-01	1.18E+00	2.90E-01	<MDA	<MDA	
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Th-234	<MDA	<MDA	1.97E+00	9.18E-01	<MDA	<MDA	
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	

TABLE 8.
(Continued)

Analytical Parameter	EL# 6440		EL# 6441		EL# 6442	
	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	b	b	8.24E-03	7.29E-03	<MDA	<MDA
I-129	b	b	<MDA	<MDA	<MDA	<MDA
Pu-238	b	b	<MDA	<MDA	<MDA	<MDA
Pu-239/240	b	b	<MDA	<MDA	<MDA	<MDA
Ra-226	b	b	2.28E+00	4.96E-01	1.98E+00	5.66E-01
Ra-228	b	b	8.31E-01	1.47E-01	1.11E+00	1.64E-01
Sr-90	b	b	<MDA	<MDA	<MDA	<MDA
Th-228	b	b	1.29E+00	1.46E-01	1.58E+00	1.74E-01
Th-230	b	b	1.72E+00	1.86E-01	1.88E+00	2.02E-01
Th-232	b	b	1.12E+00	1.29E-01	1.53E+00	1.68E-01
U-234	b	b	9.74E-01	2.55E-01	9.2E-01	2.44E-01
U-235	b	b	<MDA	<MDA	<MDA	<MDA
U-238	b	b	1.18E+00	2.89E-01	9.36E-01	2.46E-01

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 8.
(Continued)

Analytical Parameter	EL# 6443		EL# 6444		EL# 6445	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	2.03E+01	1.31E+01	2.03E+01	1.31E+01	1.49E+01	1.12E+01
Gross β	3.32E+01	5.17E+00	3.03E+01	4.93E+00	2.88E+01	4.81E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.06E+01	1.79E+00	1.57E+01	1.97E+00	1.70E+01	1.97E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	<MDA	<MDA	9.27E-02	4.30E-02	7.68E-01	1.05E-01
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	3.00E-01	7.10E-02	3.65E-01	7.48E-02	3.46E-01	7.95E-02
Bi-212	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pb-212	1.13E+00	1.63E-01	1.04E+00	1.46E-01	9.22E-01	1.62E-01
Bi-214	<MDA	<MDA	9.56E+00	2.20E+00	<MDA	<MDA
Pb-214	<MDA	<MDA	6.28E+00	8.48E-01	6.48E+00	9.76E-01
Ra-224	3.30E+00	1.21E+00	<MDA	<MDA	<MDA	<MDA
Ra-226	4.61E+00	2.17E+00	3.20E+00	9.73E-01	3.98E+00	1.95E+00
Ac-228	<MDA	<MDA	1.25E+00	2.29E-01	1.04E+00	1.82E-01
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 8.
(Continued)

Analytical Parameter	EL# 6443		EL# 6444		EL# 6445	
	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	b	b	b	b	b	b
I-129	b	b	b	b	b	b
Pu-238	b	b	b	b	b	b
Pu-239/240	b	b	b	b	b	b
Ra-226	b	b	b	b	b	b
Ra-228	b	b	b	b	b	b
Sr-90	b	b	b	b	b	b
Th-228	b	b	b	b	b	b
Th-230	b	b	b	b	b	b
Th-232	b	b	b	b	b	b
U-234	b	b	b	b	b	b
U-235	b	b	b	b	b	b
U-238	b	b	b	b	b	b

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 8.
(Continued)

Analytical Parameter	EL# 6446		EL# 6447		EL# 6448	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	1.85E+01	1.25E+01	1.76E+01	1.22E+01	1.76E+01	1.22E+01
Gross β	2.84E+01	4.77E+00	3.16E+01	5.03E+00	3.82E+01	5.54E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	2.09E+01	3.80E+00	2.13E+01	2.39E+00	1.48E+01	2.24E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	4.14E-01	1.79E-01	<MDA	<MDA	<MDA	<MDA
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	3.52E-01	1.84E-01	3.87E-01	8.42E-02	<MDA	<MDA
Bi-212	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pb-212	1.33E+00	3.75E-01	1.31E+00	1.90E-01	1.50E+00	1.98E-01
Bi-214	1.74E+01	6.26E+00	8.16E+00	2.11E+00	7.34E+00	1.08E+00
Pb-214	5.79E+00	1.72E+00	6.47E+00	8.90E-01	<MDA	<MDA
Ra-224	4.12E+00	2.94E+00	2.84E+00	1.46E+00	3.16E+00	1.33E+00
Ra-226	<MDA	<MDA	3.42E+00	2.12E+00	<MDA	<MDA
Ac-228	<MDA	<MDA	1.09E+00	2.46E-01	<MDA	<MDA
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	1.45E+00	8.99E-01	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 8.
(Continued)

Analytical Parameter	EL# 6446		EL# 6447		EL# 6448	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	b	b	<MDA	<MDA	<MDA	<MDA
I-129	b	b	<MDA	<MDA	<MDA	<MDA
Pu-238	b	b	<MDA	<MDA	<MDA	<MDA
Pu-239/240	b	b	<MDA	<MDA	<MDA	<MDA
Ra-226	b	b	2.38E+00	5.25E-01	2.40E+00	4.80E-01
Ra-228	b	b	9.95E-01	1.73E-01	1.17E+00	1.70E-01
Sr-90	b	b	<MDA	<MDA	<MDA	<MDA
Th-228	b	b	1.71E+00	1.88E-01	7.1E-01	8.82E-02
Th-230	b	b	2.2E+00	2.34E-01	1.68E+00	1.79E-01
Th-232	b	b	1.54E+00	1.71E-01	6.57E-01	8.21E-02
U-234	b	b	9.87E-01	2.50E-01	8.87E-01	2.65E-01
U-235	b	b	<MDA	<MDA	7.99E-02	6.90E-02
U-238	b	b	1.21E+00	2.87E-01	1.22E+00	3.29E-01

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 8.
(Continued)

Analytical Parameter	EL# 6449		EL# 6450		EL# 6451	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	1.13E+01	9.77E+00	1.94E+01	1.28E+01	1.58E+01	1.15E+01
Gross β	2.92E+01	4.84E+00	3.20E+01	5.07E+00	3.16E+01	5.03E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.91E+01	2.20E+00	1.86E+01	2.09E+00	1.61E+01	1.94E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	3.51E-01	7.65E-02	2.83E-01	5.73E-02	5.82E-01	8.85E-02
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	3.78E-01	7.45E-02	3.17E-01	6.96E-02	3.44E-01	7.75E-02
Bi-212	<MDA	<MDA	1.97E+00	8.78E-01	1.54E+00	7.29E-01
Pb-212	1.05E+00	1.52E-01	9.80E-01	1.63E-01	1.10E+00	1.75E-01
Bi-214	<MDA	<MDA	<MDA	<MDA	9.57E+00	2.28E+00
Pb-214	7.00E+00	9.00E-01	6.96E+00	9.59E-01	7.16E+00	9.64E-01
Ra-224	<MDA	<MDA	2.24E+00	1.20E+00	2.73E+00	1.37E+00
Ra-226	3.54E+00	1.48E+00	3.11E+00	1.56E+00	3.92E+00	1.70E+00
Ac-228	1.17E+00	2.01E-01	1.15E+00	2.42E-01	1.09E+00	2.26E-01
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	<MDA	<MDA	1.77E+00	7.84E-01
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 8.
(Continued)

Analytical Parameter	EL# 6449		EL# 6450		EL# 6451	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	b	b	b	b	b	b
I-129	b	b	b	b	b	b
Pu-238	b	b	b	b	b	b
Pu-239/240	b	b	b	b	b	b
Ra-226	b	b	b	b	b	b
Ra-228	b	b	b	b	b	b
Sr-90	b	b	b	b	b	b
Th-228	b	b	b	b	b	b
Th-230	b	b	b	b	b	b
Th-232	b	b	b	b	b	b
U-234	b	b	b	b	b	b
U-235	b	b	b	b	b	b
U-238	b	b	b	b	b	b

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 8.
(Continued)

EL# 6452		EL# 6453		EL# 6454		
Analytical Parameter	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	3.29E+01	1.66E+01	1.85E+01	1.25E+01	1.96E+01	1.36E+01
Gross β	3.22E+01	5.08E+00	3.37E+01	5.20E+00	3.70E+01	5.45E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.15E+01	1.90E+00	2.32E+01	2.59E+00	2.22E+01	2.46E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	9.37E-02	6.64E-02	<MDA	<MDA	<MDA	<MDA
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	<MDA	<MDA	4.29E-01	8.36E-02	4.20E-01	7.83E-02
Bi-212	<MDA	<MDA	<MDA	<MDA	2.09E+00	9.55E-01
Pb-212	1.20E+00	1.68E-01	1.30E+00	1.73E-01	1.19E+00	1.98E-01
Bi-214	<MDA	<MDA	7.15E+00	9.73E-01	<MDA	<MDA
Pb-214	<MDA	<MDA	5.98E+00	8.08E-01	6.06E+00	8.79E-01
Ra-224	2.70E+00	1.19E+00	2.20E+00	1.10E+00	<MDA	<MDA
Ra-226	3.87E+00	1.74E+00	<MDA	<MDA	3.18E+00	1.64E+00
Ac-228	<MDA	<MDA	1.40E+00	3.33E-01	1.36E+00	2.65E-01
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	2.10E+00	1.46E+00	<MDA	<MDA	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 8.
(Continued)

Analytical Parameter	EL# 6452		EL# 6453		EL# 6454	
	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	b	b	b	b	b	b
I-129	b	b	b	b	b	b
Pu-238	b	b	b	b	b	b
Pu-239/240	b	b	b	b	b	b
Ra-226	b	b	b	b	b	b
Ra-228	b	b	b	b	b	b
Sr-90	b	b	b	b	b	b
Th-228	b	b	b	b	b	b
Th-230	b	b	b	b	b	b
Th-232	b	b	b	b	b	b
U-234	b	b	b	b	b	b
U-235	b	b	b	b	b	b
U-238	b	b	b	b	b	b

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 8.
(Continued)

EL# 6455		
Analytical Parameter	Result (pCi/g)	2 σ (pCi/g)
Gross α	1.13E+01	9.77E+00
Gross β	3.54E+01	5.33E+00
RAL Gamma Spectroscopy Results		
Be-7	<MDA	<MDA
K-40	1.92E+01	2.23E+00
Co-60	<MDA	<MDA
Nb-94	<MDA	<MDA
Sb-125	<MDA	<MDA
I-131	<MDA	<MDA
Cs-134	<MDA	<MDA
Cs-137	1.70E-01	7.86E-02
Eu-152	<MDA	<MDA
Tl-208	4.01E-01	7.85E-02
Bi-212	2.10E+00	9.89E-01
Pb-212	1.32E+00	1.93E-01
Bi-214	<MDA	<MDA
Pb-214	6.21E+00	8.90E-01
Ra-224	2.56E+00	1.43E+00
Ra-226	3.30E+00	1.92E+00
Ac-228	1.36E+00	2.47E-01
Th-228	<MDA	<MDA
Th-234	1.38E+00	8.58E-01
U-235	<MDA	<MDA
Am-241	<MDA	<MDA
Pa-234m	1.05E+01	7.50E+00

TABLE 8.
(Continued)

EL# 6455		
Analytical Parameter	Result (pCi/g)	2 σ (pCi/g)
ITAS Alpha spectroscopy results		
Am-241	<MDA	<MDA
I-129	<MDA	<MDA
Pu-238	<MDA	<MDA
Pu-239/240	<MDA	<MDA
Ra-226	1.91E+00	5.32E-01
Ra-228	8.25E-01	1.71E-01
Sr-90	<MDA	<MDA
Th-228	1.28E+00	1.44E-01
Th-230	1.55E+00	1.69E-01
Th-232	1.18E+00	1.34E-01
U-234	1.02E+00	3.09E-01
U-235	<MDA	<MDA
U-238	1.30E+00	3.65E-01

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 9.
ANALYTICAL RESULTS FOR SOIL SAMPLES FROM SS-JN1-2

Analytical Parameter	EL# 6456		EL# 6457		EL# 6458	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	1.94E+01	1.28E+01	2.12E+01	1.34E+01	1.13E+01	9.77E+00
Gross β	3.24E+01	5.10E+00	4.48E+02	1.89E+01	1.37E+02	1.05E+01
RAL Gamma Spectroscopy Results						
Be-7	<MDA ^a	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.79E+01	2.02E+00	3.55E+00	1.36E+00	6.20E+00	3.35E+00
Co-60	<MDA	<MDA	2.50E+00	3.51E-01	1.41E+00	3.07E-01
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	1.95E+00	3.83E-01	<MDA	<MDA
Cs-137	<MDA	<MDA	3.44E+02	3.43E+01	1.18E+02	NR ^b
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	3.06E-01	7.73E-02	<MDA	<MDA	<MDA	<MDA
Bi-212	1.36E+00	6.66E-01	<MDA	<MDA	<MDA	<MDA
Pb-212	9.24E-01	1.55E-01	<MDA	<MDA	<MDA	<MDA
Bi-214	<MDA	<MDA	<MDA	<MDA	2.70E+00	1.71E+00
Pb-214	7.88E+00	1.02E+00	<MDA	<MDA	<MDA	<MDA
Ra-224	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Ra-226	3.91E+00	1.64E+00	<MDA	<MDA	<MDA	<MDA
Ac-228	1.14E+00	2.07E-01	<MDA	<MDA	1.14E+00	6.97E-01
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 9.
(Continued)

Analytical Parameter	EL# 6456		EL# 6457		EL# 6458	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	2.52E-02	1.83E-02	1.12E-01	2.17E-02	4.99E-02	1.49E-02
I-129	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pu-238	<MDA	<MDA	1.01E-01	2.27E-02	2.45E-02	1.71E-02
Pu-239/240	<MDA	<MDA	1.08E-01	2.38E-02	4.65E-02	2.51E-02
Ra-226	2.33E+00	5.04E-01	NR ^b	NR ^b	NR ^b	NR ^b
Ra-228	8.14E-01	1.33E-01	2.87E-01	1.16E-01	3.88E-01	9.11E-02
Sr-90	6.58E-02	7.08E-02	3.14E-01	1.67E-01	7.69E-01	2.00E-01
Th-228	1.02E+00	1.17E-01	8.11E-01	9.88E-02	1.56E+00	1.71E-01
Th-230	1.94E+00	2.03E-01	1.90E+00	2.02E-01	2.10E+00	2.20E-01
Th-232	1.00E+00	1.14E-01	6.61E-01	8.32E-02	1.41E+00	1.55E-01
U-234	1.15E+00	2.44E-01	9.10E-01	1.98E-01	9.41E-01	2.09E-01
U-235	<MDA	<MDA	<MDA	<MDA	3.87E-02	3.43E-02
U-238	1.33E+00	2.70E-01	9.47E-01	2.03E-01	9.82E-01	2.15E-01

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.

^b NR = not reported.

TABLE 10.
(Continued)

Analytical Parameter	EL# 6310		EL# 6311		EL# 6312	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	2.26E-02	1.28E-02	<MDA	<MDA	<MDA	<MDA
I-129	<MDA	<MDA	<MDA	<MDA	8.34E-01	4.03E-01
Pu-238	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pu-239/240	3.19E-02	1.20E-02	<MDA	<MDA	<MDA	<MDA
Ra-226	2.40E+00	5.12E-01	2.74E+00	6.02E-01	2.30E+00	5.62E-01
Ra-228	8.82E-01	1.41E-01	1.08E+00	1.61E-01	1.16E+00	1.87E-01
Sr-90	6.32E-02	7.54E-02	4.72E-02	6.16E-02	<MDA	<MDA
Th-228	1.12E+00	1.29E-01	1.05E+00	1.21E-01	1.46E+00	1.60E-01
Th-230	1.84E+00	1.96E-01	1.58E+00	1.70E-01	2.03E+00	2.12E-01
Th-232	9.12E-01	1.08E-01	1.09E+00	1.24E-01	1.51E+00	1.64E-01
U-234	1.28E+00	3.29E-01	1.22E+00	2.94E-01	1.12E+00	2.48E-01
U-235	3.34E-02	4.14E-02	6.23E-02	5.34E-02	5.98E-02	4.52E-02
U-238	1.24E+00	3.21E-01	1.17E+00	2.84E-01	1.25E+00	2.68E-01

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 10.
(Continued)

Analytical Parameter	EL# 6313		EL# 6314		EL# 6315	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	2.43E+01	1.43E+01	1.26E+01	1.03E+01	2.25E+01	1.38E+01
Gross β	3.38E+01	5.21E+00	3.58E+01	5.36E+00	3.21E+01	5.07E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.95E+01	2.42E+00	1.59E+01	1.97E+00	2.06E+01	2.53E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	1.27E+00	1.64E-01	6.51E-02	4.74E-02	<MDA	<MDA
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	<MDA	<MDA	4.63E-01	1.10E-01	<MDA	<MDA
Bi-212	<MDA	<MDA	2.06E+00	1.33E+00	<MDA	<MDA
Pb-212	1.11E+00	1.67E-01	1.43E+00	1.91E-01	<MDA	<MDA
Bi-214	1.05E+01	1.37E+00	1.02E+01	1.29E+00	9.99E+00	1.31E+00
Pb-214	<MDA	<MDA	7.88E+00	9.87E-01	<MDA	<MDA
Ra-224	3.47E+00	1.29E+00	2.89E+00	1.15E+00	<MDA	<MDA
Ra-226	5.28E+00	2.58E+00	4.43E+00	1.60E+00	<MDA	<MDA
Ac-228	<MDA	<MDA	1.39E+00	3.12E-01	<MDA	<MDA
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	2.25E+00	1.56E+00	<MDA	<MDA	2.69E+00	1.56E+00
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 10.
(Continued)

Analytical Parameter	EL# 6313		EL# 6314		EL# 6315	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	3.42E-02	1.32E-02	b	b	b	b
I-129	<MDA	<MDA	b	b	b	b
Pu-238	<MDA	<MDA	b	b	b	b
Pu-239/240	3.32E-02	2.09E-02	b	b	b	b
Ra-226	2.64E+00	5.30E-01	b	b	b	b
Ra-228	7.91E-01	1.44E-01	b	b	b	b
Sr-90	4.73E-02	6.98E-02	b	b	b	b
Th-228	1.40E+00	1.54E-01	b	b	b	b
Th-230	2.23E+00	2.32E-01	b	b	b	b
Th-232	1.25E+00	1.39E-01	b	b	b	b
U-234	1.24E+00	2.92E-01	b	b	b	b
U-235	3.59E-02	3.84E-02	b	b	b	b
U-238	1.22E+00	2.88E-01	b	b	b	b

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 10.
(Continued)

		EL# 6316		EL# 6317		EL# 6318	
Analytical Parameter	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	
Gross α	2.07E+01	1.32E+01	1.89E+01	1.26E+01	1.89E+01	1.26E+01	
Gross β	3.20E+01	5.07E+00	2.56E+01	4.53E+00	3.13E+01	5.01E+00	
RAL Gamma Spectroscopy Results							
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
K-40	1.55E+01	1.87E+00	1.56E+01	2.13E+00	1.80E+01	2.12E+00	
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Cs-137	1.37E+00	1.61E-01	1.69E-01	7.53E-02	1.30E-01	5.25E-02	
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Tl-208	3.32E-01	6.94E-02	<MDA	<MDA	5.02E-01	8.88E-02	
Bi-212	<MDA	<MDA	<MDA	<MDA	2.36E+00	1.31E+00	
Pb-212	1.03E+00	1.50E-01	<MDA	<MDA	1.56E+00	1.98E-01	
Bi-214	1.20E+01	2.54E+00	1.08E+01	2.70E+00	1.05E+01	1.30E+00	
Pb-214	7.97E+00	1.05E+00	<MDA	<MDA	8.20E+00	1.07E+00	
Ra-224	1.69E+00	9.91E-01	<MDA	<MDA	2.74E+00	1.16E+00	
Ra-226	3.12E+00	1.21E+00	4.77E+00	1.98E+00	3.92E+00	1.57E+00	
Ac-228	1.08E+00	2.01E-01	<MDA	<MDA	1.50E+00	3.11E-01	
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Th-234	<MDA	<MDA	2.95E+00	1.48E+00	<MDA	<MDA	
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA	

TABLE 10.
(Continued)

Analytical Parameter	EL# 6316		EL# 6317		EL# 6318	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	1.56E-02	8.25E-03	<MDA	<MDA	<MDA	<MDA
I-129	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pu-238	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pu-239/240	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Ra-226	2.36E+00	4.98E-01	2.31E+00	4.37E-01	2.88E+00	5.36E-01
Ra-228	7.66E-01	1.36E-01	9.5E-01	1.54E-01	1.34E+00	1.89E-01
Sr-90	5.76E-02	7.23E-02	<MDA	<MDA	5.92E-02	7.44E-02
Th-228	1.02E+00	1.20E-01	1.46E+00	1.61E-01	1.91E+00	2.09E-01
Th-230	1.79E+00	1.92E-01	2.19E+00	2.29E-01	2.05E+00	2.21E-01
Th-232	1.01E+00	1.17E-01	1.48E+00	1.62E-01	1.65E+00	1.82E-01
U-234	1.04E+00	2.91E-01	1.08E+00	2.41E-01	9.64E-01	2.56E-01
U-235	<MDA	<MDA	4.83E-02	4.166E-02	<MDA	<MDA
U-238	1.12E+00	3.06E-01	1.06E+00	2.37E-01	1.15E+00	2.88E-01

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 10.
(Continued)

Analytical Parameter	EL# 6319		EL# 6320		EL# 6321	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	1.80E+01	1.23E+01	2.25E+01	1.38E+01	1.26E+01	1.03E+01
Gross β	2.90E+01	4.83E+00	2.80E+01	4.74E+00	2.98E+01	4.89E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.67E+01	1.97E+00	1.36E+01	2.01E+00	1.86E+01	2.17E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	1.85E+00	2.08E-01	3.44E-01	8.20E-02	4.42E-01	7.67E-02
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	3.48E-01	8.87E-02	<MDA	<MDA	4.19E-01	8.26E-02
Bi-212	1.49E+00	1.12E+00	<MDA	<MDA	2.03E+00	8.99E-01
Pb-212	1.01E+00	1.50E-01	1.34E+00	1.88E-01	1.40E+00	1.86E-01
Bi-214	<MDA	<MDA	<MDA	<MDA	1.03E+01	2.31E+00
Pb-214	7.23E+00	9.82E-01	<MDA	<MDA	7.65E+00	9.87E-01
Ra-224	1.43E+00	1.02E+00	3.46E+00	1.32E+00	2.68E+00	1.14E+00
Ra-226	3.58E+00	1.11E+00	<MDA	<MDA	3.52E+00	1.11E+00
Ac-228	1.12E+00	2.75E-01	<MDA	<MDA	1.44E+00	3.00E-01
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	2.56E+00	1.64E+00	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 10.
(Continued)

Analytical Parameter	EL# 6319		EL# 6320		EL# 6321	
	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	b	b	b	b	b	b
I-129	b	b	b	b	b	b
Pu-238	b	b	b	b	b	b
Pu-239/240	b	b	b	b	b	b
Ra-226	b	b	b	b	b	b
Ra-228	b	b	b	b	b	b
Sr-90	b	b	b	b	b	b
Th-228	b	b	b	b	b	b
Th-230	b	b	b	b	b	b
Th-232	b	b	b	b	b	b
U-234	b	b	b	b	b	b
U-235	b	b	b	b	b	b
U-238	b	b	b	b	b	b

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 10.
(Continued)

Analytical Parameter	EL# 6322		EL# 6323		EL# 6324	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	1.76E+01	1.22E+01	1.85E+01	1.25E+01	8.6E+00	8.5E+00
Gross β	2.92E+01	4.84E+00	3.12E+01	5.00E+00	2.92E+01	4.84E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.43E+01	1.71E+00	1.68E+01	2.20E+00	9.38E+00	1.85E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	1.29E+00	1.52E-01	1.04E-01	7.51E-02	<MDA	<MDA
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	2.90E-01	9.60E-02	<MDA	<MDA	<MDA	<MDA
Bi-212	1.63E+00	8.02E-01	2.39E+00	1.09E+00	<MDA	<MDA
Pb-212	9.26E-01	1.39E-01	1.44E+00	1.98E-01	<MDA	<MDA
Bi-214	8.98E+00	1.12E+00	1.29E+01	3.42E+00	<MDA	<MDA
Pb-214	7.20E+00	9.52E-01	<MDA	<MDA	<MDA	<MDA
Ra-224	1.34E+00	9.54E-01	3.20E+00	1.40E+00	<MDA	<MDA
Ra-226	3.55E+00	1.41E+00	<MDA	<MDA	4.51E+00	1.86E+00
Ac-228	1.04E+00	1.98E-01	<MDA	<MDA	1.44E+00	3.21E-01
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	2.32E+00	1.61E+00	2.92E+00	1.45E+00
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 10.
(Continued)

Analytical Parameter	EL# 6322		EL# 6323		EL# 6324	
	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	1.64E-02	9.44E-03	b	b	b	b
I-129	<MDA	<MDA	b	b	b	b
Pu-238	<MDA	<MDA	b	b	b	b
Pu-239/240	3.91E-02	1.48E-02	b	b	b	b
Ra-226	2.13E+00	4.68E-01	b	b	b	b
Ra-228	8.51E-01	1.45E-01	b	b	b	b
Sr-90	1.20E-01	7.91E-02	b	b	b	b
Th-228	9.43E-01	1.13E-01	b	b	b	b
Th-230	1.65E+00	1.80E-01	b	b	b	b
Th-232	9.22E-01	1.10E-01	b	b	b	b
U-234	1.34E+00	3.38E-01	b	b	b	b
U-235	<MDA	<MDA	b	b	b	b
U-238	1.28E+00	3.26E-01	b	b	b	b

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 10.
(Continued)

Analytical Parameter	EL# 6325		EL# 6326		EL# 6327	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	9.5E+00	9.0E+00	1.67E+01	1.19E+01	2.21E+01	1.36E+01
Gross β	3.10E+01	4.99E+00	2.98E+01	4.89E+00	3.28E+01	5.13E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.62E+01	1.92E+00	9.03E+00	1.94E+00	<MDA	<MDA
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	1.66E+00	1.91E-01	<MDA	<MDA	2.52E-01	6.13E-02
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	3.95E-01	8.96E-02	<MDA	<MDA	5.37E-01	1.04E-01
Bi-212	1.31E+00	8.56E-01	<MDA	<MDA	<MDA	<MDA
Pb-212	1.11E+00	1.60E-01	<MDA	<MDA	1.57E+00	2.02E-01
Bi-214	1.10E+01	2.21E+00	<MDA	<MDA	1.03E+01	1.30E+00
Pb-214	7.78E+00	1.05E+00	<MDA	<MDA	8.28E+00	1.04E+00
Ra-224	1.57E+00	1.07E+00	<MDA	<MDA	2.06E+00	1.21E+00
Ra-226	3.83E+00	1.19E+00	<MDA	<MDA	3.83E+00	1.09E+00
Ac-228	1.12E+00	2.79E-01	<MDA	<MDA	1.66E+00	3.22E-01
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	3.34E+00	1.60E+00	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 10.
(Continued)

Analytical Parameter	EL# 6325		EL# 6326		EL# 6327	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	b	b	b	b	b	b
I-129	b	b	b	b	b	b
Pu-238	b	b	b	b	b	b
Pu-239/240	b	b	b	b	b	b
Ra-226	b	b	b	b	b	b
Ra-228	b	b	b	b	b	b
Sr-90	b	b	b	b	b	b
Th-228	b	b	b	b	b	b
Th-230	b	b	b	b	b	b
Th-232	b	b	b	b	b	b
U-234	b	b	b	b	b	b
U-235	b	b	b	b	b	b
U-238	b	b	b	b	b	b

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 10.
(Continued)

Analytical Parameter	EL# 6328		EL# 6329		EL# 6330	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	2.75E+01	1.52E+01	1.04E+01	9.37E+00	1.58E+01	1.15E+01
Gross β	3.09E+01	4.98E+00	3.13E+01	5.01E+00	3.40E+01	5.22E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.02E+01	1.66E+00	1.47E+01	1.83E+00	1.59E+01	2.19E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	1.86E+00	2.19E-01	7.36E-02	4.48E-02	4.36E-01	9.47E-02
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	<MDA	<MDA	4.02E-01	8.60E-02	<MDA	<MDA
Bi-212	<MDA	<MDA	1.94E+00	9.22E-01	<MDA	<MDA
Pb-212	<MDA	<MDA	1.23E+00	1.62E-01	1.40E+00	1.98E-01
Bi-214	9.44E+00	2.43E+00	9.28E+00	1.15E+00	1.07E+01	3.14E+00
Pb-214	<MDA	<MDA	7.51E+00	9.94E-01	<MDA	<MDA
Ra-224	<MDA	<MDA	1.84E+00	9.54E-01	3.51E+00	1.40E+00
Ra-226	<MDA	<MDA	3.21E+00	1.25E+00	<MDA	<MDA
Ac-228	<MDA	<MDA	1.25E+00	2.71E-01	<MDA	<MDA
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	8.20E+00	5.91E+00	<MDA	<MDA

TABLE 10.
(Continued)

Analytical Parameter	EL# 6328		EL# 6329		EL# 6330	
	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	b	b	b	b	b	b
I-129	b	b	b	b	b	b
Pu-238	b	b	b	b	b	b
Pu-239/240	b	b	b	b	b	b
Ra-226	b	b	b	b	b	b
Ra-228	b	b	b	b	b	b
Sr-90	b	b	b	b	b	b
Th-228	b	b	b	b	b	b
Th-230	b	b	b	b	b	b
Th-232	b	b	b	b	b	b
U-234	b	b	b	b	b	b
U-235	b	b	b	b	b	b
U-238	b	b	b	b	b	b

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

TABLE 10.
(Continued)

Analytical Parameter	EL# 6331		EL# 6332		EL# 6333	
	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)	Result (pCi/g)	2 σ (pCi/g)
Gross α	9.5E+00	9.0E+00	1.04E+01	9.37E+00	1.76E+01	1.22E+01
Gross β	2.49E+01	4.47E+00	2.84E+01	4.78E+00	3.08E+01	4.98E+00
RAL Gamma Spectroscopy Results						
Be-7	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
K-40	1.22E+01	1.84E+00	1.64E+01	1.93E+00	1.52E+01	2.12E+00
Co-60	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Nb-94	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Sb-125	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
I-131	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-134	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Cs-137	<MDA	<MDA	2.60E-01	5.94E-02	<MDA	<MDA
Eu-152	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Tl-208	<MDA	<MDA	3.32E-01	7.02E-02	<MDA	<MDA
Bi-212	<MDA	<MDA	1.78E+00	1.14E+00	<MDA	<MDA
Pb-212	<MDA	<MDA	8.71E-01	1.48E-01	<MDA	<MDA
Bi-214	1.01E+01	2.30E+00	1.07E+01	1.30E+00	8.46E+00	1.20E+00
Pb-214	<MDA	<MDA	8.02E+00	9.95E-01	<MDA	<MDA
Ra-224	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Ra-226	4.09E+00	1.60E+00	3.96E+00	1.27E+00	<MDA	<MDA
Ac-228	1.19E+00	2.76E-01	9.90E-01	2.30E-01	<MDA	<MDA
Th-228	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Th-234	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
U-235	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Am-241	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA
Pa-234m	<MDA	<MDA	<MDA	<MDA	<MDA	<MDA

TABLE 10.
(Continued)

Analytical Parameter	EL# 6331		EL# 6332		EL# 6333	
	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)	Result (pCi/g)	2σ (pCi/g)
ITAS Alpha Spectroscopy Results						
Am-241	b	b	b	b	b	b
I-129	b	b	b	b	b	b
Pu-238	b	b	b	b	b	b
Pu-239/240	b	b	b	b	b	b
Ra-226	b	b	b	b	b	b
Ra-228	b	b	b	b	b	b
Sr-90	b	b	b	b	b	b
Th-228	b	b	b	b	b	b
Th-230	b	b	b	b	b	b
Th-232	b	b	b	b	b	b
U-234	b	b	b	b	b	b
U-235	b	b	b	b	b	b
U-238	b	b	b	b	b	b

^a <MDA indicates sample result for specific parameter was less than the minimum detectable activity.
^b Sample not selected for alpha spectroscopy.

ATTACHMENT A

**STORM SEWER OUTFALL CHARACTERIZATION PLAN
FOR THE WEST JEFFERSON SITE**

DD-93-14
Revision 0
March 31, 1993

DECONTAMINATION AND DECOMMISSIONING OPERATIONS

STORM SEWER OUTFALL CHARACTERIZATION PLAN FOR THE WEST JEFFERSON SITE

**BATTELLE
505 King Avenue
Columbus, Ohio 43201**

Prepared by:

P.H.G.
Patrick H. Gorman

DD-93-14
Revision 0
Page i of i
March 31, 1993

PROCEDURE/PLAN APPROVAL PAGE

This plan, DD-93-14 has been reviewed and approved by the following.

APPROVED BY:

Mark E Jackson
M.E. Jackson
RC and ES&H Oversight

4/2/93
Date

S.J. Layendecker
S.J. Layendecker
Safety, Health & Environmental Support

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Decontamination Operations

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S.R. Brown
S.R. Brown
Quality

4/2/93
Date

1.0 PURPOSE

Potential radiological contamination at the West Jefferson site will be the subject of remedial action as part of the Battelle Columbus Laboratory Decontamination and Decommissioning Project (BCLDP). The Storm Sewer Outfall Characterization Plan for the West Jefferson Site formulates and describes BCLDP's program to:

- 1) identify storm sewer outfalls at the West Jefferson site,
- 2) characterize the area surrounding each outfall with respect to possible radiological contamination, and
- 3) quantify relevant parameters for any soil, sediment or storm runoff found to be contaminated.

This plan has been developed to ensure that all of the discharge pathways for radionuclides from buildings JN-1, JN-2 and JN-3 are accounted for and characterized, in preparation for BCLDP activities at the West Jefferson site.

2.0 BACKGROUND

Liquid effluent and other environmental samples are routinely taken at the West Jefferson site as part of the BCLDP (BCLDP Environmental Monitoring Plan, DD-93-06). The storm sewer outfall that is routinely monitored drains the vicinity of buildings JN-1 and JN-4. Other storm sewer outfalls are known to exist, and recent radioanalyses of one-time-only effluent samples (liquid effluent samples JN-1 SS: 01/02/03, collected 2/12/93) taken from two of the known storm sewer outfalls at the site (outfalls SS-JN1-1 and SS-JN1-2, shown in Figures 1 and 2) indicate slightly elevated levels of Radium 226 and Cesium 137.

3.0 RESPONSIBILITIES

Safety, Health, and Environmental Support (Decontamination Operations, BCLDP) has primary responsibility for conducting the storm sewer outfall characterization described in this plan. Subsidiary responsibilities related to the collection of samples under this plan are addressed in the following applicable activity-specific procedures: establishing soil sample grids (SC-SP-003), identifying sample locations (SC-SP-003), collecting surface soil samples (SC-SP-004.2), collecting soil core samples (SC-SP-004), collecting liquid effluent samples (EM-SP-002), collecting sediment samples (SC-SP-006), and handling samples for laboratory analysis (EL-AP-1.0). Samples will be taken by technicians trained and qualified in compliance with the requirements of TD-AP-02.0, "Indoctrination, Training, and Qualification."

4.0 STORM SEWER OUTFALL IDENTIFICATION

Figure 1 shows the locations of storm sewer outfalls at the West Jefferson site, as recorded on official site plans. Figure 2 is an aerial photograph of the West Jefferson site showing the locations of storm sewer outfalls. Storm sewer outfalls noted as being "TO GRADE" in official site plans are approximate. Identifier numbers have been assigned to the known outfalls for the purpose of developing the characterization plan. The storm sewer outfalls shown on West Jefferson site plans are listed in Table 1, along with their current status.

5.0 STORM SEWER OUTFALL CHARACTERIZATION

5.1 RADIOLOGICAL CONSIDERATIONS IN PREPARATION FOR SAMPLING

An initial radiological survey of each area to be sampled, including background locations, should be taken using a uR meter. Readings should be taken at three to six inches above each sampling location. If radioactivity is detected above background by a statistically significant amount (i.e., readings greater than 100 CCPM on a 100 cm²-surface area probe, assuming the standard ten percent detection efficiency), a NaI uR meter should be used to establish boundaries for the contaminated area.

The radioanalytical laboratory requires approximately 3,000 grams of collected solids to satisfy the laboratory's minimum detectable activity (MDA) requirements (i.e., release criteria). For soil and sediment samples, this corresponds to roughly 2,300 ml to 2,500 ml of soil or sediment. Aggregation of multiple samples taken at an individual sample grid point may be necessary in some cases to ensure that the total sample volume per sample point meets laboratory MDA's (release criteria). Guidelines for sample collection to meet MDAs are listed below:

Soil/Sediment Core Sample Dimensions	Sample Volume	Number of Cores Required per Sample Location
2" diam., 12" length	618 ml	4
3" diam., 12" length	1,390 ml	2
4" diam., 6" length	1,235 ml	2
4" diam., 12" length	2,470 ml	1
6" diam., 6" length	2,780 ml	1

Throughout this plan, "one sample" is to be interpreted to mean the number of samples or cores taken at one sampling location required to meet the radioanalytical laboratory's MDAs.

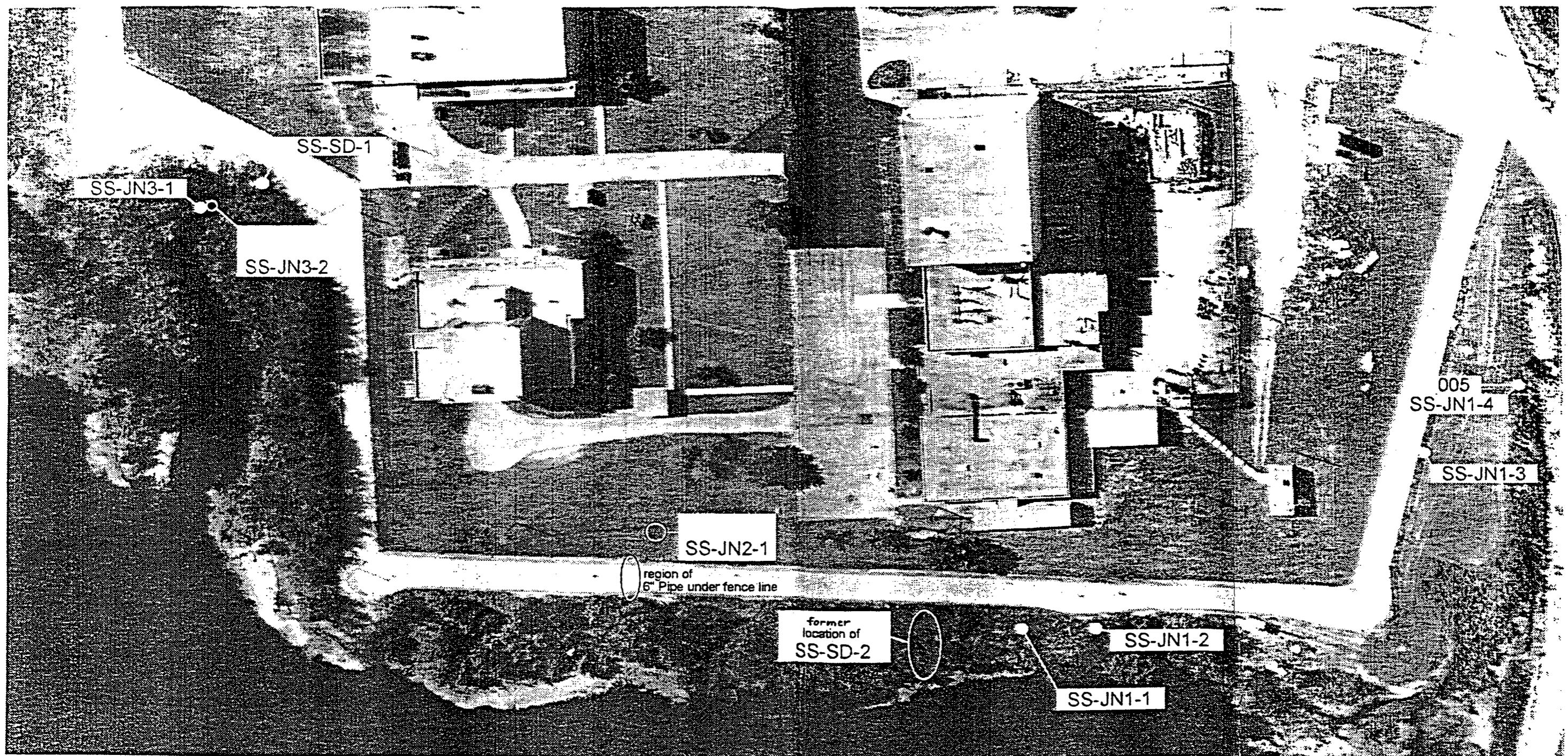


Figure 2. Aerial Photograph of West Jefferson Storm Sewer Outfalls

Table 1. West Jefferson Site Storm Sewer Outfalls

<u>Outfall #</u>	<u>Drainage Area</u>	<u>Outfall Location</u>
SS-JN3-1	foundation and roof of JN-3	at water's edge at head of cove of Battelle Lake, west of JN-2
SS-JN3-2	foundation and roof of JN-3	on steep bank at head of cove of lake, west of JN-2, very near outfall SS-JN3-1
SS-SD-1	surface drain between JN-2 and JN-3	near top of steep bank at head of cove, west of JN-2, east of SS-JN3-1
SS-JN2-1	foundation and roof of JN-2	in flat field between JN-2 & JN-3, near a 6-inch drainage pipe under security fence
SS-SD-2	surface drain in front of JN-1	on steep bank of lake, south of JN-1
SS-JN1-1	foundation and roof of JN-1	on steep bank of lake, south-southeast of JN-1
SS-JN1-2	foundation and roof of JN-1	on steep bank of lake, south-southeast of JN-1
SS-JN1-3	foundation and roof of JN-1	west of outer security fence, west of JN-1 and well house
SS-JN1-4	foundation and roof of JN-1 and JN-4	Water Sampling Location 005: west of outer security fence, west-northwest of JN-1, east of road

5.2 SAMPLE COLLECTION

Approaches to individual storm sewer outfall characterization vary due to the outfall-specific terrain and geo-hydrology. All sampling, identification, handling, shipment, and storage procedures needed to carry out this plan are addressed in the procedures cited below.

For all outfalls, existing applicable procedures will be followed for:

- 1) establishing soil sample grids (SC-SP-003),
- 2) identifying sample locations (SC-SP-003),
- 3) collecting soil core samples (SC-SP-004),
- 4) collecting surface soil samples (SC-SP-004.2),
- 5) collecting liquid effluent samples (EM-SP-002),
- 6) collecting sediment samples (SC-SP-006), and
- 7) handling and documenting samples for laboratory analysis (EL-AP-1.0).

5.2.1 Radiological Background Samples

A minimum of three radiological background readings will be documented for each medium sampled in this plan (soil, sediment, and water). Background readings may be adapted from samples collected as part of the BCLDP environmental monitoring plan or other Battelle Columbus Laboratory activities, if available.

5.2.2 Storm Sewer Outfall SS-JN3-1

Outfall SS-JN3-1 is located at the water line (elevation 888') at the northwest end of a small cove of Battelle Lake, due east of building JN-2, as shown in Figure 2. A preliminary radiological characterization of SS-JN3-1 will be performed by collecting and analyzing samples as follows, based on guidelines in "Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance," DOE/EH-0173T:

- 1) One liquid effluent sample will be taken at the end of the outfall pipe (grid point D4 in Figure 3) during or within one day following a storm event.

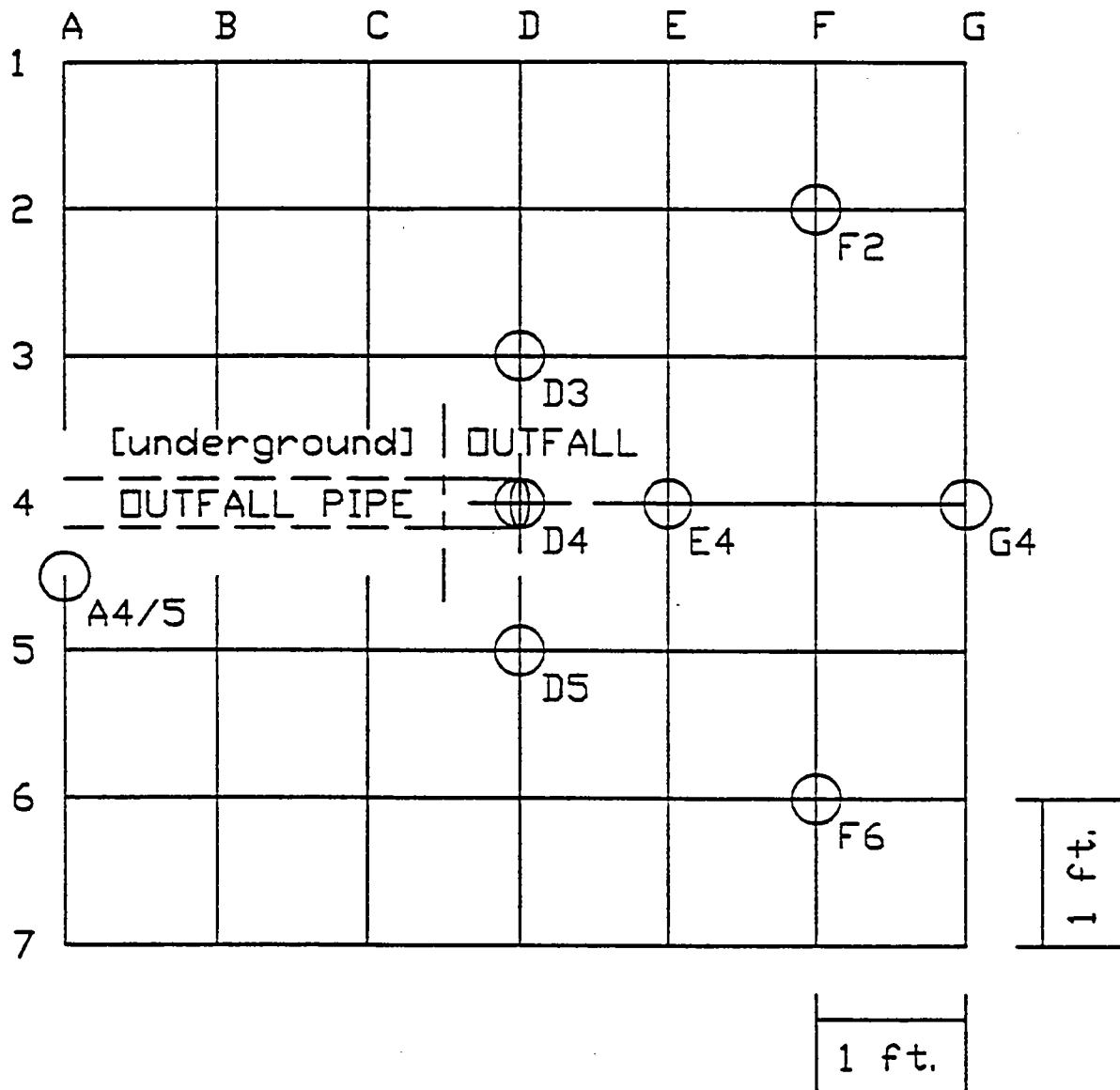


Figure 3. Generic Flat-Ground Sampling Grid

- 2) Three sediment core samples, each two feet long, will be taken from points along the cove, as shown in Figure 4. The top and bottom twelve inch core segments will be packaged, labeled, and analyzed separately. Sediment sample point #1 is three feet in front of the outfall (the point corresponds to grid point G4 in Figure 3). Sediment sample point #2 is midway between the head of the cove and its outlet. Sediment sample point #3 is at the outlet of the cove.

5.2.3 Storm Sewer Outfall SS-JN3-2

Outfall SS-JN3-2 is near the water line at the northwest end of a small cove of Battelle Lake, three feet to the north-northeast of outfall SS-JN3-1, as shown in Figure 2. A preliminary radiological characterization of SS-JN3-1 will be performed by collecting and analyzing samples as follows, based on guidelines in "Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance," DOE/EH-0173T:

- 1) One liquid effluent sample will be taken at the end of the outfall pipe (grid point D4 in Figure 3) during or within one day following a storm event.
- 2) One surface soil sample six inches deep will be taken at the end of the outfall (grid point D4 in Figure 3).
- 3) The three sediment core samples taken from the cove as part of the characterization of SS-JN3-1 will be used to assess SS-JN3-2 as well. The sample points are shown in Figure 4.

5.2.4 Storm Sewer Outfall SS-SD-1

Outfall SS-SD-1 is located near the top of a steep slope about 16 feet (elevation 904') at the northwest end of a small cove of Battelle Lake, east of building JN-2, as shown in Figure 2. A preliminary radiological characterization of the outfall SS-SD-1 will be performed by collecting and analyzing samples near the outfall as described below, based on guidelines in "Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance," DOE/EH-0173T:

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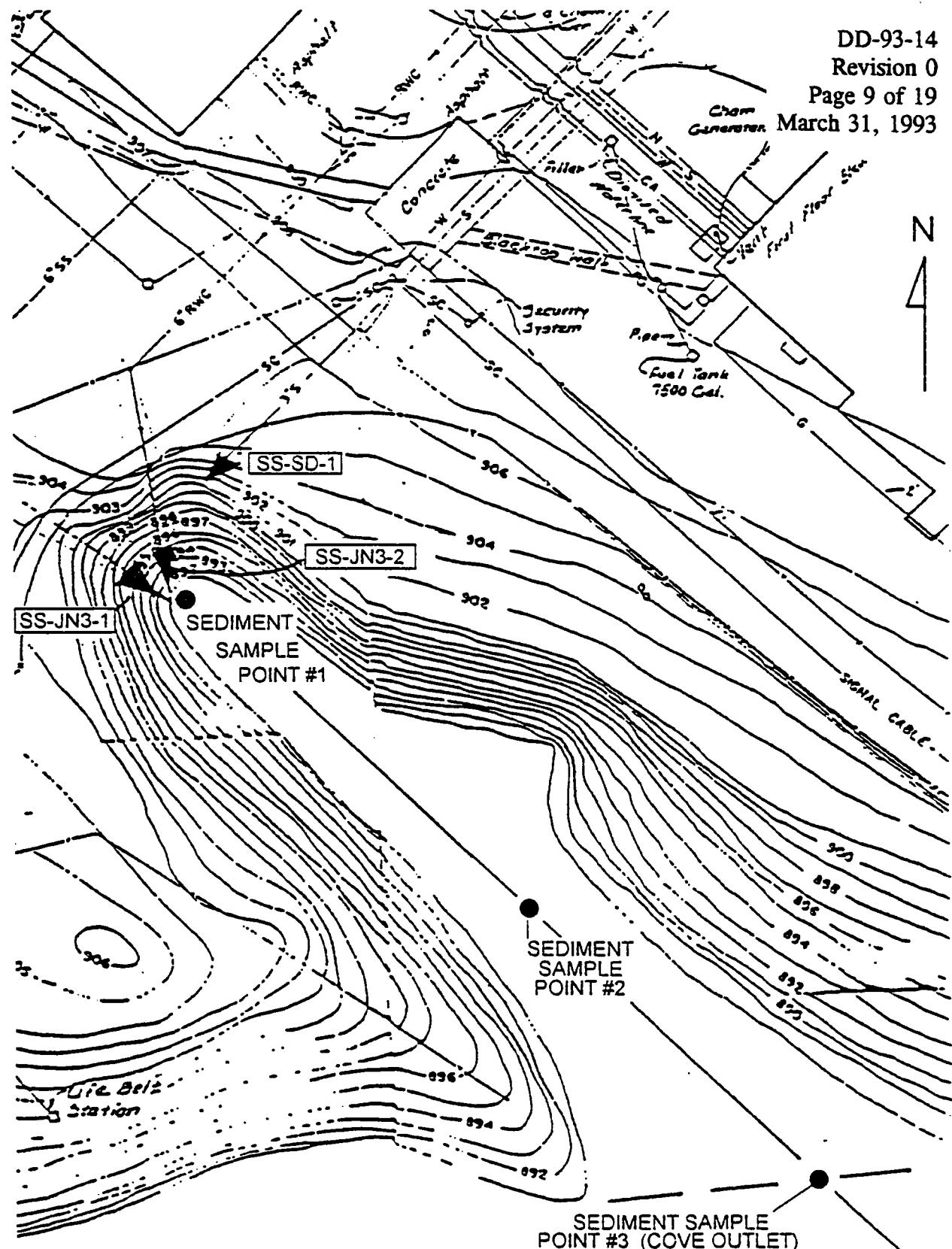


Figure 4. Sediment Sampling Points in Cove near Building JN-2

Figure 5 is a schematic diagram (not to scale) of the sample grid to be used for collecting liquid effluent, surface soil, soil core, and sediment samples below outfalls on steep slopes. It will be used to characterize outfall SS-SD-1. The sampling grid is laid out in an arc, originating at the outfall. The primary grid line (line B) runs directly down the fall line of the slope from the storm sewer outfall to the shore of the lake. Secondary grid lines originate at the outfall and run down the slope at angles clockwise 15 degrees (line A) and counterclockwise 15 degrees (line C) from the fall line (line B). Circumferential grid lines are established every three feet, measured along the ground, on fall line, as shown in Figure 5. The outfall (origin) of the grid is labeled point B1. The successive circumferential grid lines are numbered sequentially from 2 to "N," where "N" is the last line before the shore of the lake. One more grid point is established three feet along line B beyond line "N" as the point on the lake bottom where one sediment sample will be collected (i.e., point B(N+1) in Figure 5).

- 1) One liquid effluent sample will be collected from the storm sewer outfall (point B1 in Figure 5) during or within one day following a storm event.
- 2) One soil core sample two feet long will be collected from the storm sewer outfall (point B1 in Figure 5). The top and bottom twelve inch core segments will be packaged, labeled, and analyzed separately.
- 3) Surface soil samples twelve inches deep will be collected at odd-numbered grid lines along the line B, the fall line (points B3, B5, etc. in Figure 5). Each sample will be divided into a top six-inch segment and a bottom six-inch segment. These two segments will be packaged, labeled, and analyzed separately.
- 4) Surface soil samples twelve inches deep will be collected at even-numbered grid lines along lines A and C (points A2 and C2, A4 and C4, etc. in Figure 5). Each sample will be divided into a top six-inch segment and a bottom six-inch segment. These two segments will be packaged, labeled, and analyzed separately.
- 5) One sediment core sample two feet long will be collected from the lake bottom at point B(N+1) in Figure 5. The top and bottom twelve inch core segments will be packaged, labeled, and analyzed separately.

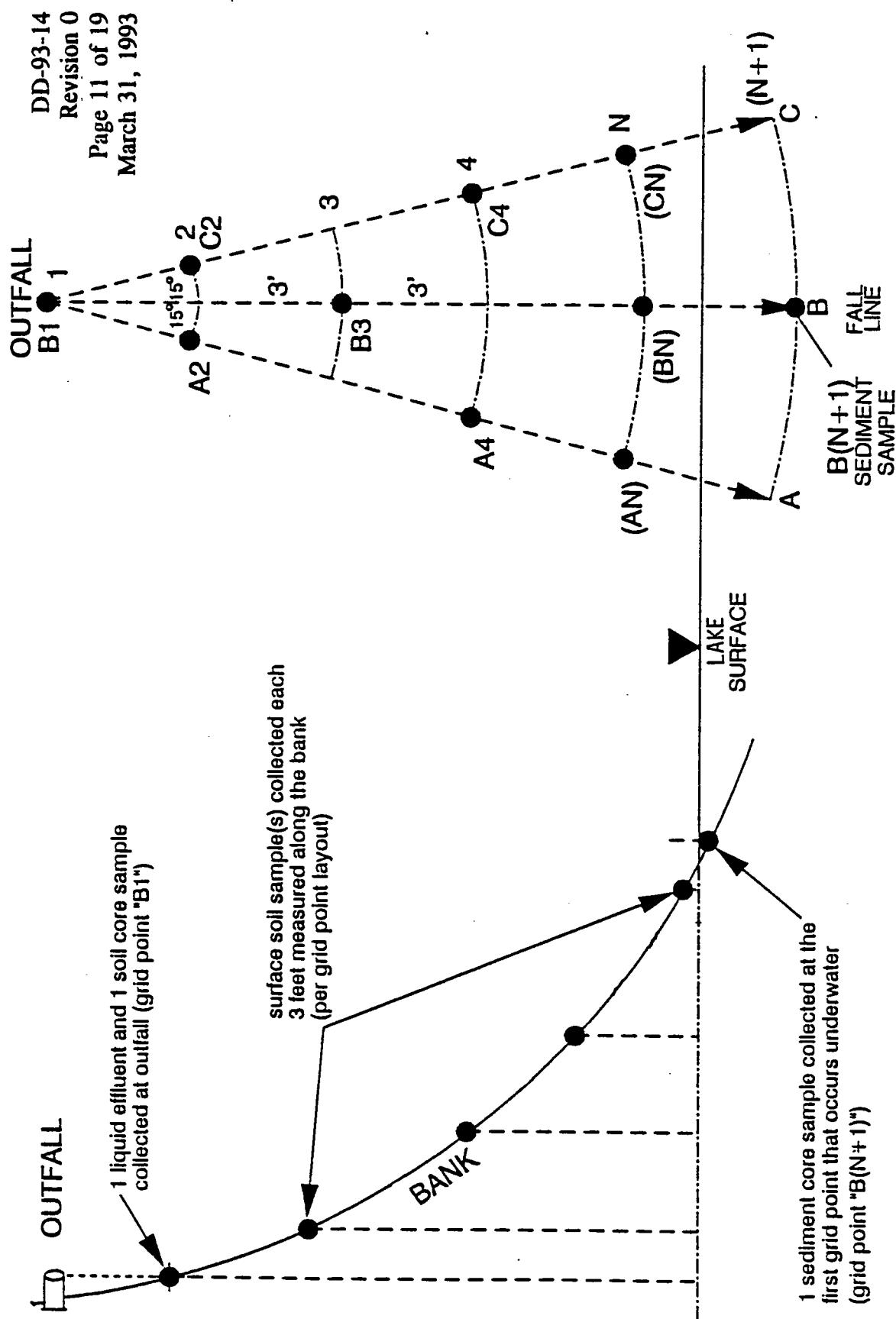


Figure 5. Generic Steep-Slope Sampling Grid

5.2.5 Storm Sewer Outfall SS-JN2-1

Storm sewer outfall SS-JN2-1 is located in a level grassy field between buildings JN-2 and JN-1. It is southeast of JN-2 and north of a six-inch drainage pipe that is buried under the south security fences (see Figure 2 and Figure 6). Because of the relatively flat topography, liquid effluent from SS-JN2-1 may have created an effluent plume in the unsaturated zone under the outfall in any direction. The following characterization program will be carried out at outfall SS-JN2-1, based on guidelines in DOE/EH-0173T. The flat-ground sampling grid shown in Figure 3 will be used.

- 1) A liquid effluent sample will be taken during or within one day following a storm event at the outfall (grid point D4 in Figure 3).
- 2) Soil core samples to a total depth of three feet will be taken at grid points F2, D3, D4, E4, G4, D5, F6, and point "A4/5." Point A4/5 is a special case because it is located very near the underground portion of the sewer pipe. Care must be taken to position the sampler as near to the grid point A4 as possible without hitting the pipe.

Upon extraction, each core will be divided into three one-foot segments, labeled according to grid location and "top," "middle," and "bottom," and packaged separately. The top and bottom segments of each soil core will be analyzed as part of the outfall characterization. The middle core segment will be stored for possible future analysis.

5.2.6 Storm Sewer Outfall SS-SD-2

Storm sewer outfall SS-SD-2 was removed in 1987, and its discharge rerouted to outfall SS-JN1-1. Outfall SS-SD-2 was located on a steep bank of Battelle Lake south of building JN-1 (Figure 2 and Figure 6). Its former location is approximated by two side-by-side plastic pipes that drain the gravel area between the security fences south of the southwest corner of building JN-1. These pipes are located near the top of the slope above the lake, outside of the security fences. Based on guidelines in DOE/EH-0173T, the vicinity of the discontinued outfall SS-SD-2 will be subjected to a basic radiological sampling and survey to assess the effect of past liquid effluent discharges from that point.

- 1) One surface soil sample twelve inches deep will be taken at the end of the outfalls of the twin drainage pipes. The sample will be divided into a top six-inch segment and a bottom six-inch segment. These two segments will be packaged, labeled, and analyzed separately.

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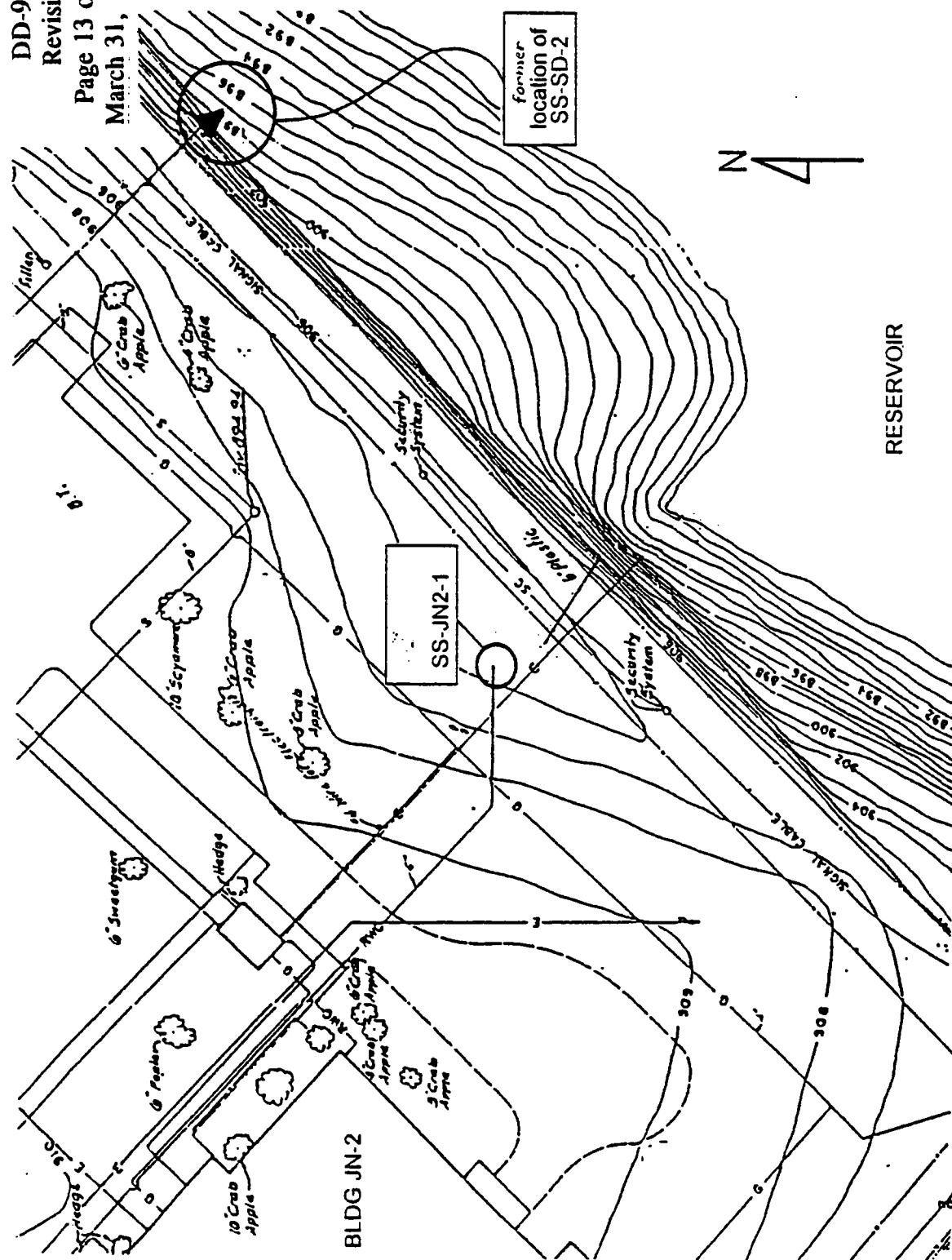


Figure 6. Locations of Storm Sewer Outfalls SS-JN2-1 and SS-SD-2

- 2) A preliminary radiological survey, using a uR meter, will be conducted in the area extending from the twin drainage pipes (described above) to the shore of the lake (see Figure 2). Readings will be taken at three to six inches above the ground. If radioactivity is detected above background by a statistically significant amount (i.e., readings greater than 100 cccpm on a 100 cm²-surface area probe, assuming the standard ten percent detection efficiency), a NaI uR meter will be used to re-survey the area and establish boundaries for the contaminated area.

5.2.7 Storm Sewer Outfalls SS-JN1-1 and SS-JN1-2

Storm sewer outfalls SS-JN1-1 and SS-JN1-2 are located on a steep bank of Battelle Lake southeast of JN-1 about twelve feet (elevation 900') above the water surface (see Figure 2 and Figure 7).

Based on guidelines in DOE/EH-0173T, the steep-slope sample grid (Figure 5) will be used for collecting liquid effluent, soil core, surface soil, and sediment samples below each of the outfalls SS-JN1-1 and SS-JN1-2. Note that SS-JN1-1 and SS-JN1-2 are close enough together that they may have some sampling points in common near the water.

- 1) One liquid effluent sample will be collected from the storm sewer outfall (point B1 in Figure 5) during or within one day following a storm event.
- 2) One soil core sample two feet long will be collected from the storm sewer outfall (point B1 in Figure 5). The top and bottom twelve inch core segments will be packaged, labeled, and analyzed separately.
- 3) Surface soil samples twelve inches deep will be collected at odd-numbered grid lines along the line B, the fall line (points B3, B5, etc.). Each sample will be divided into a top six-inch segment and a bottom six-inch segment. These two segments will be packaged, labeled, and analyzed separately.
- 4) Surface soil samples twelve inches deep will be collected at even-numbered grid lines along lines A and C (points A2 and C2, A4 and C4, etc.). Each sample will be divided into a top six-inch segment and a bottom six-inch segment. These two segments will be packaged, labeled, and analyzed separately.

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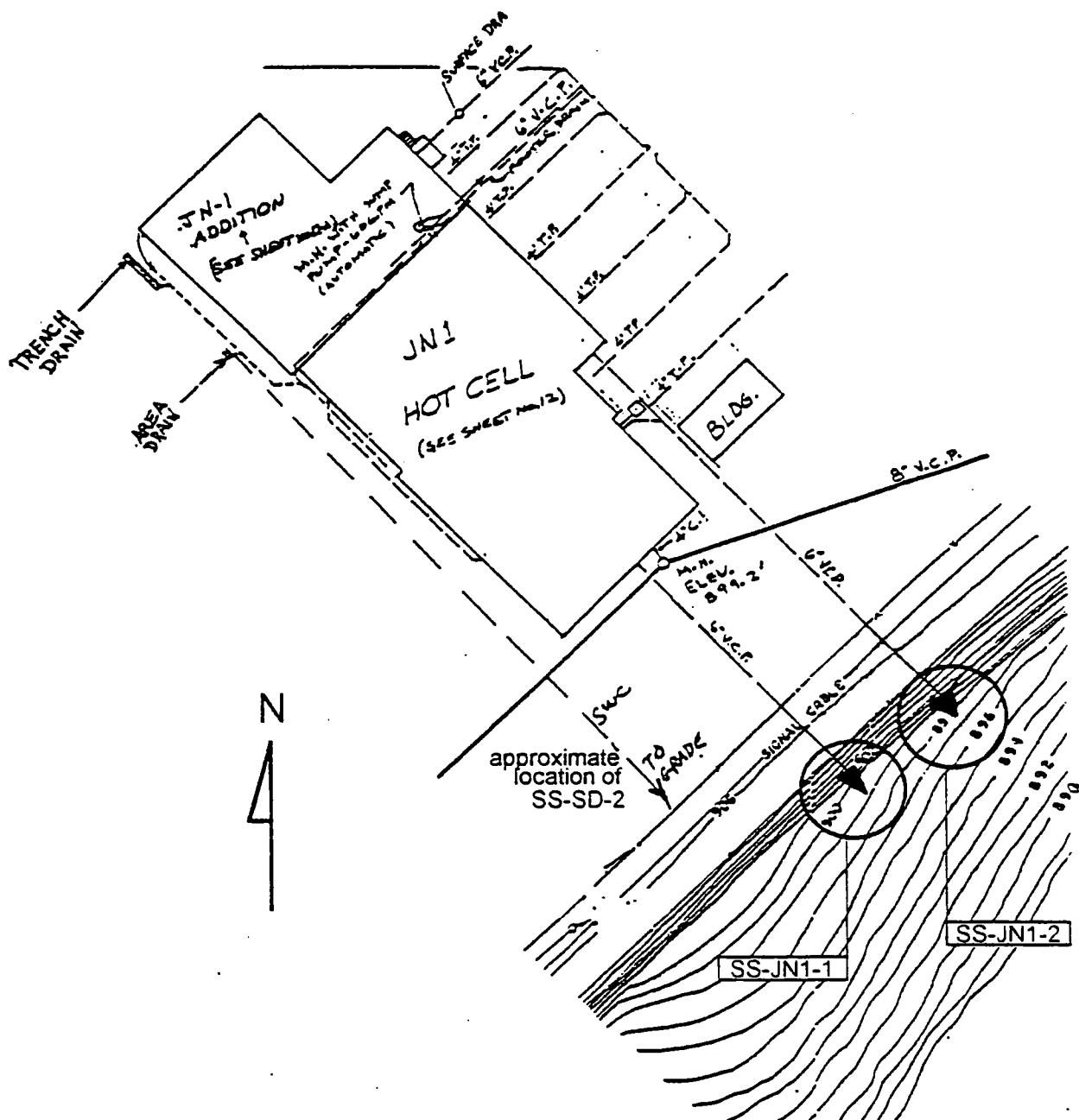


Figure 7. Locations of Storm Sewer Outfalls SS-JN1-1 and SS-JN1-2

5.2.8 Storm Sewer Outfall SS-JN1-3

Storm sewer outfall SS-JN1-3 is located a few feet west of outer security fence, due west of building JN-1 and the well house. Its location is clearly marked. It is on gently sloping land leading to an outwash plain at the northeast corner of Battelle Lake (see Figure 2 and Figure 8). Because of the relatively flat topography, liquid effluent from SS-JN1-3 may create an effluent plume in the unsaturated zone under the outfall in any direction. The flat-ground sampling grid shown in Figure 3 will be used.

- 1) A liquid effluent sample will be taken during or within one day following a storm event at the outfall (grid point D4 in Figure 3).
- 2) Soil core samples to a total depth of three feet will be taken at grid points F2, D3, D4, E4, G4, D5, F6, and point "A4/5." Point A4/5 is a special case because it is located very near the underground portion of the sewer pipe. Care must be taken to position the sampler as near to the grid point A4 as possible without hitting the pipe.

Upon extraction, each core will be divided into three one-foot segments, labeled according to grid location and "top," "middle," and "bottom," and packaged separately. The top and bottom segments of each soil core will be analyzed as part of the outfall characterization. The middle core segment will be stored for possible future analysis.

5.2.9 Storm Sewer Outfall SS-JN1-4

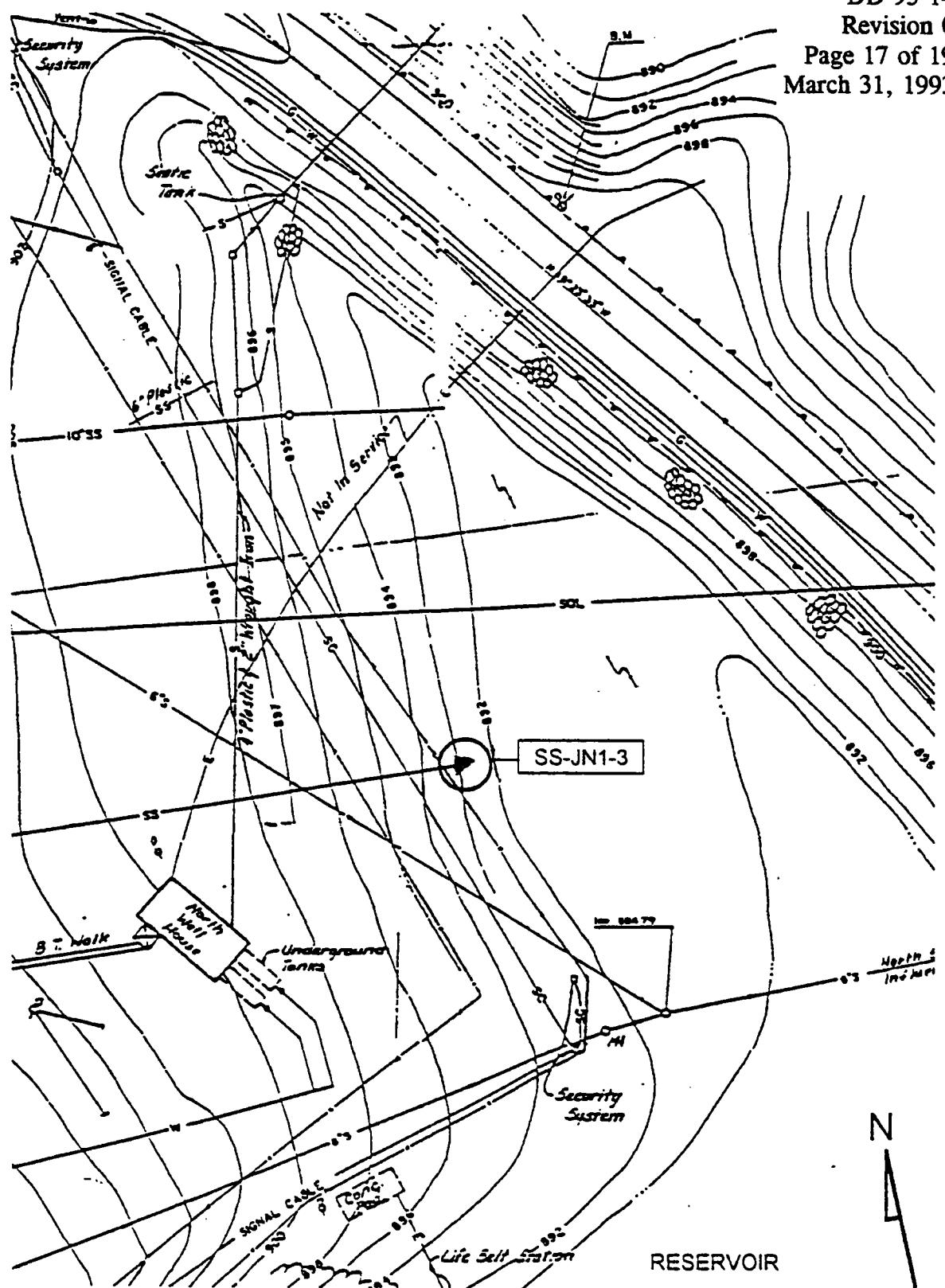
Storm sewer outfall SS-JN1-4 has been monitored in the past (liquid effluent sampling point 005) and appears to be well-characterized. No additional outfall characterization is planned for SS-JN1-4 at this time.

5.3 SAMPLE ANALYSES

To make the storm sewer outfall characterization data as comparable as is possible with the data collected for the BCLDP environmental monitoring program, the following radioanalyses will be performed on each liquid, soil, and sediment sample collected:

- * gross alpha
- * gross beta
- * gamma spectroscopic analysis
- * Isotopic U, Pu, Th, Sr-90, Am-241, Ra-226, Ra-228, and I-129

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5.4 CONTINGENCY CHARACTERIZATION PLANNING

In the event that analyses of the samples collected under this characterization plan indicate radioactive contamination, and indicate the contamination extends beyond the sampling grids established herein, BCLDP Safety, Health, and Environmental Support will develop and implement appropriate additional outfall characterization plans to determine the extent of contamination plume(s).

6.0 QUALITY

The activities described in this plan will be performed in accordance with the DDO Quality Manual. This manual describes a BCLDP Quality Program that implements applicable requirements of ANSI/ASME NQA-1 and DOE Order 5700.6C. No additional quality measures are needed for this specific activity.

Work planning, direction, performance, and documentation will be controlled using the normal BCLDP method of plans, procedures, work instructions, and worker qualifications (QD-AP-2.1, QD-AP-5.1, QD-AP-6.1, and TD-AP-02.0).

7.0 REFERENCES

- ANSI/ASME NQA-1 Quality Assurance Program Requirements for Nuclear Facilities
- DD-93-06 Environmental Monitoring Plan for BCCLDP
- DOE Order 5700.6C Quality Assurance
- DOE/EH-0173T Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance
- EL-AP-1.0 Administrative Operating Procedures for the Radioanalytical Laboratory
- EM-SP-002 Procedure for the Collection of Environmental Radiological Water and Liquid Effluent Samples
- QD-AP-2.1 Program Quality Grading
- QD-AP-5.1 Preparation of Procedures
- QD-AP-6.1 Document Control
- SC-SP-003 Establishment of Sampling Grids and Identification of Sampling Locations in Support of Soil Sample Collection
- SC-SP-004 Collection of Soil Core Samples in Support of Site Soil Characterization
- SC-SP-004.2 Manual Collection of Surface Soil Samples in Support of Site Characterization
- SC-SP-006 Sampling of Sediment and Sludge in Ponds, Streams, Sumps, and Closures
- TD-AP-02.0 Indoctrination, Training, and Qualification